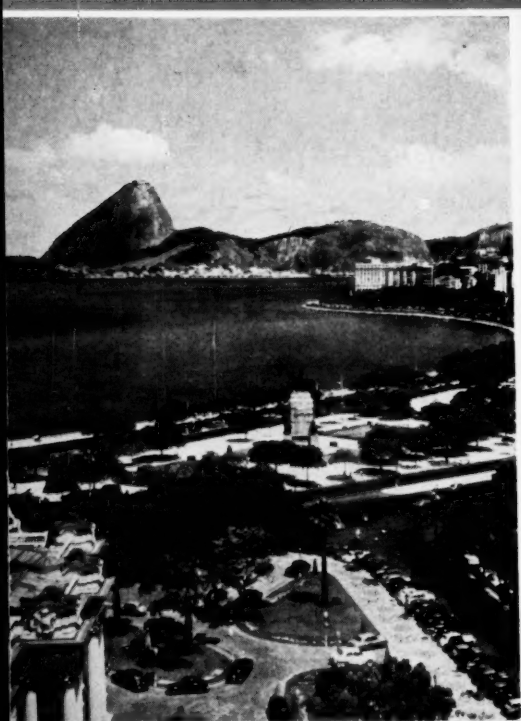


# Chemical Week

February 16, 1957

Price 35 cents



Is a recession in the cards? Or are the pessimists wrong? Here's the consensus . . . . . p. 21

Fluidized solid-solid reactions will get first large-scale pilot test in cement making . . . . . p. 108

◀ Europe's exports to Latin America are losing ground to stiffening U. S. competition . . . . . p. 47

◀ Specialty selling in the home is a lucrative business. Here's how to cash in on it . . . . . p. 58

New cresol, cresylic sources will mean a 50% increase in supplies by 1961 . . . . . p. 98

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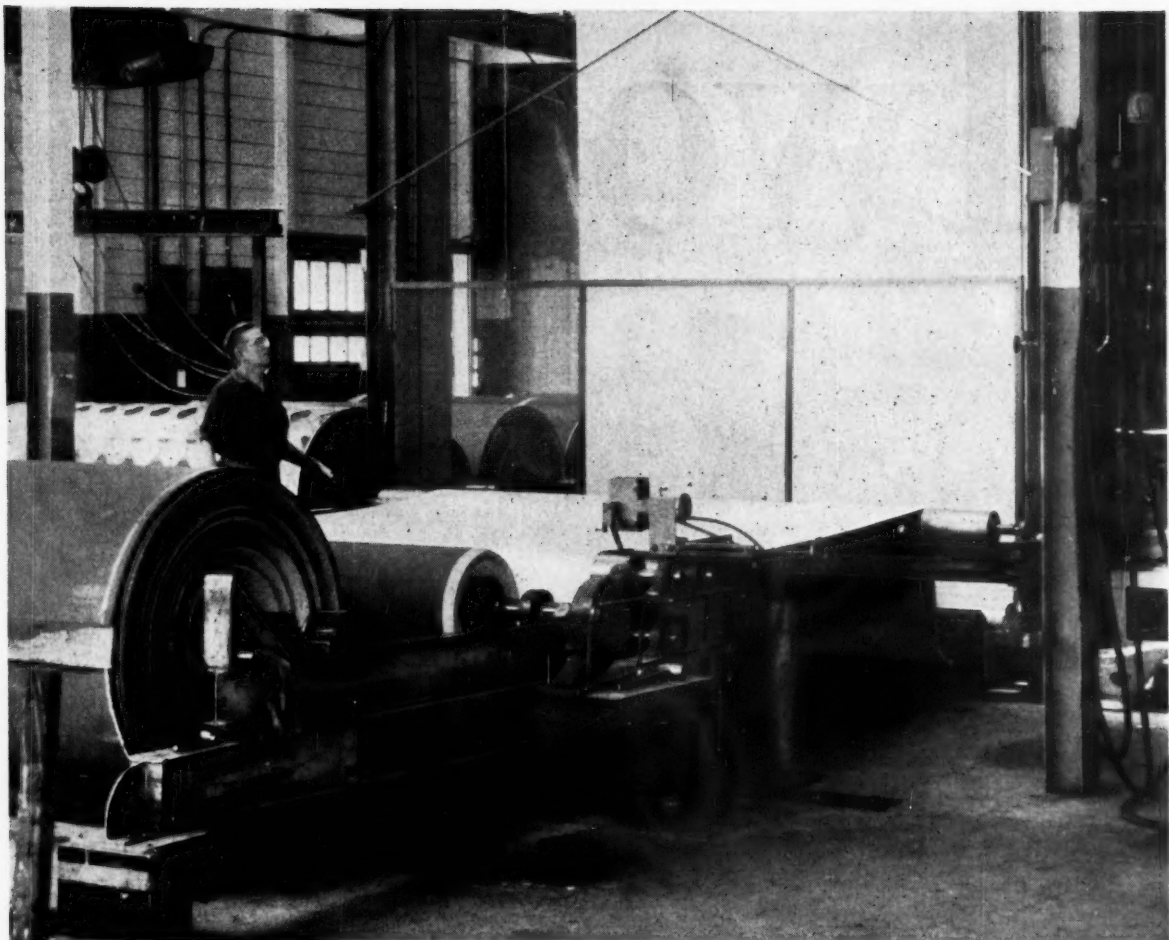


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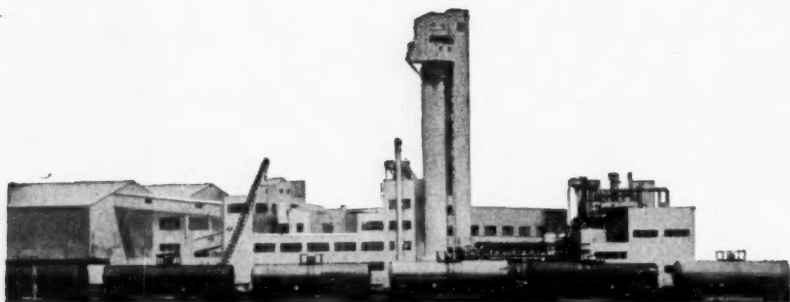
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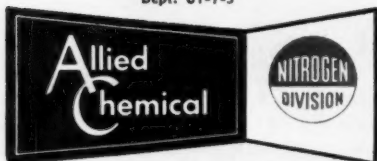
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# Chemical Week

## TOP OF THE WEEK

February 16, 1957

**That Trans-Canada gas pipeline** will bring petrochemical potential to new areas of North America . . p. 24

**What about stock option and purchase plans?** Most large chemical firms have tried them out—but use them sparingly . . . . . p. 27

**Are simultaneous strikes being used** as a union tactic to force bargaining at a multiplant level? . . . . . p. 28

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A lot of chemical specialties

are sold by door-to-door salesmen

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116 AEC's first power demonstration reactor goes critical

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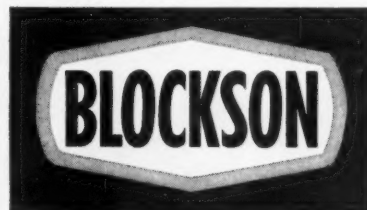
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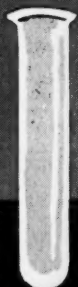


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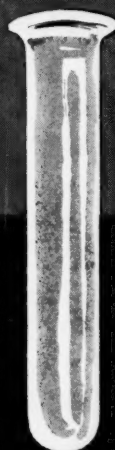
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IGEPAL CO-630	9-10	65	
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# Chemical Week

February 16, 1957

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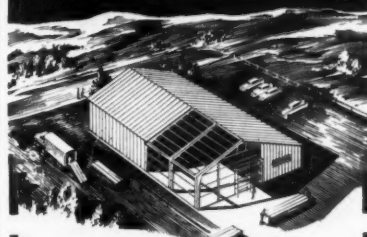
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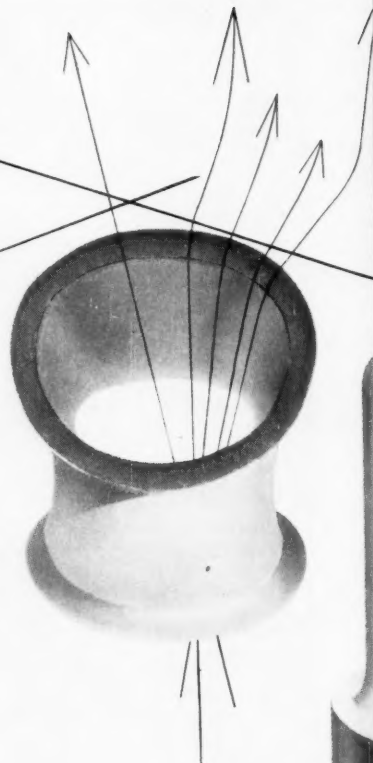
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


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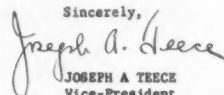
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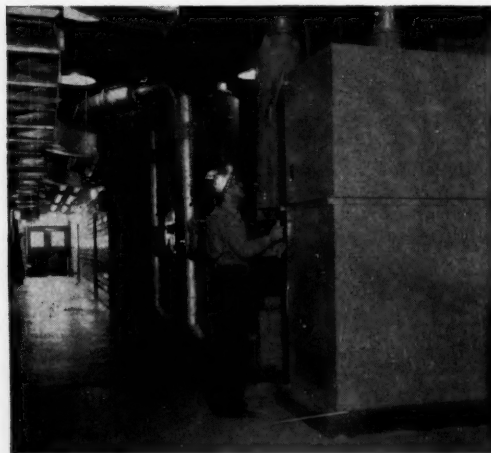
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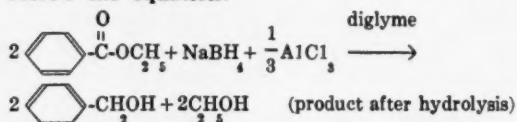
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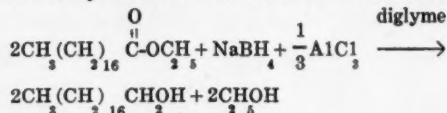
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\* Journal of the American Chemical Society, 77, 3164 (1955) Herbert C. Brown B. C. Subba Rao

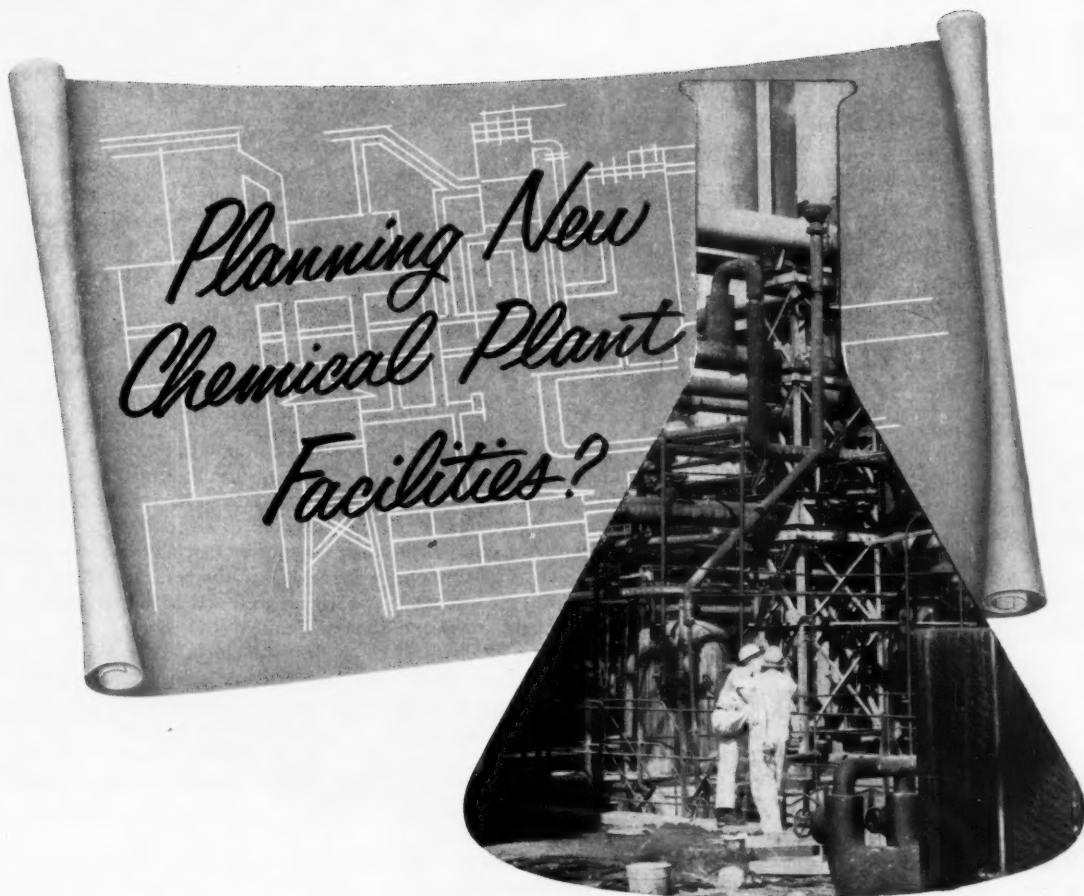


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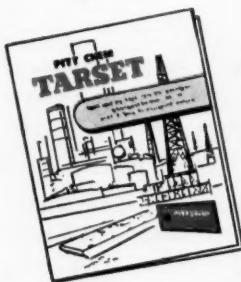
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February 16, 1957 • Chemical Week

# OPINION

## Another View on Gifts

TO THE EDITOR: Just a few more words to add to the muddle about Christmas gifts. Our company has discouraged the use of gifts as a promotional for obtaining orders. Suppliers have been advised that gifts will play little, if any, part in their receiving an order.

Good representation, good business manners, good service and good quality of merchandise are of greater interest to us.

The writer does not appreciate having given charitable gifts presented in his name and prefers to choose his own objective in matters of charity. It is my belief that the giver receives the blessing and not the one who is commemorated.

R. B. TRUSLER

Vice-President in charge of research  
The Davies-Young Soap Co.  
Dayton, O.

## Patent Lawyer Protests

TO THE EDITOR: As a patent lawyer, I was dismayed by Mr. Vannevar Bush's proposal for opposition proceedings in the Patent Office prior to the grant of a patent (*CW*, Jan. 12, p. 32).

Such a provision would create a situation of near chaotic proportions. It would impose completely unnecessary burdens upon patent applicants, the public, and the staff of the Patent Office. Surely Mr. Bush did not intend to create a large volume of business for patent lawyers.

Elaborate procedures would have to be set up within the Patent Office for handling such oppositions, which, like patent interferences, would be tantamount to full-dress trials. Opposers and applicants exercising their prerogatives of taking appeals would delay the issuance of patents upwards of probably three to five years, a sufficient time to render the patents virtually useless in some rapidly advancing fields of technology.

Such oppositions would not only open the door to crackpots and grudge-bearers but would also create an arena for costly patent opposition battles between corporations waging wars of attrition in order to enhance their own patent positions to the detriment of their competitors. Additionally, the individual patent applicant of modest

means could not withstand the assault of a more affluent opposer, and consequently his invention, upon which he had invested his resources, often at a sacrifice, might be denied protection.

The foregoing are only a few of the hazards implicit in the proposed opposition practice. The best solution of this problem is contained in Mr. Bush's other proposal to broaden the scope and intensity of the patent-examining operations so that stronger patents will issue.

The further proposal that patents should be granted only in situations where protection is needed to bring a useful invention into production is contrary to the philosophy of our patent laws as established in the Constitution, Article 1, Sec. 8: "... To promote the progress of science and useful arts ..."

This philosophy is realized by the requirement that the patentee disclose his invention to the public in the form of a published patent, which adds to the body of our technical knowledge. Mr. Bush's proposal would, in effect, retard rather than promote progress in science and technology. We patent lawyers, as well as scientists, engineers and businessmen, are familiar with many meritorious inventions that have been patented some years prior to their being brought into production, since they had been developed long before our technology was sufficiently advanced to produce satisfactory or commercially feasible embodiments thereof. The issuance of a patent also stimulates others to make improvements thereon, whereby our technological progress is accelerated.

Also, many a worthwhile patent requires intensive and expensive market surveys and promotional campaigns in order to create consumer demand for the new product, and no sensible businessman would undertake such a program without patent protection in his pocket. What may not be marketable when the patent is issued may turn out to be a "hot item" several years later when new conditions and circumstances prevail.

It is time to lay to rest the recurring canard of "suppression of patents" articulated for many years past by various sociologists and economists who have made the unwarranted assumption that, because the subject matter of a patent is not in production, it has

been suppressed. What they do not realize is that suppression of patents by their owners is not at all practical since the substance of the invention has been disclosed in the issued patent published by the government, and the information therein cannot be withdrawn from circulation. The issued patent affords others the opportunity to make improvements or to produce equally good devices that utilize inventions that are different from those in the supposedly suppressed patent and, as a result, our principles of free competition are thereby more fully realized. Unless verified case histories are adduced to the contrary, I venture to suggest that any one who has "suppressed" a patent has never retarded progress and has never profited thereby.

Notwithstanding the foregoing, there is room for improvement of our patent laws, which—it must not be forgotten—have played an important role in making the U.S.A. what it is and which will continue to provide tangible incentives for our free-enterprise economy.

I. JORDAN KUNIK

Counselor at Law-Patent Attorney  
New York

## Profit from Waste

TO THE EDITOR: The article, "Tapping Chemical Junk for Profits" (*Jan. 19*, p. 66) does not mention our company as an active member of this growing group of enterprisers.

Six years ago, we began doing this work, not limiting ourselves to solvent recovery, but handling a wide range of wastes, residues and by-products. We soon decided that no one plant could have the equipment or experienced personnel necessary to do all these jobs well. So we began affiliating with plants in this area, each equipped to

*CW* welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to:  
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Week, 330 W. 42nd St., New  
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**NEVILLE CHEMICAL COMPANY • PITTSBURGH 25, PA.**



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NC-24CW

do a different type of work. We now have five. . .

The economics of these wastes often requires setting up equipment at the source. We then design and install in the customer's plant (as in the case of our boric acid recovery) and contract to buy the output, thus assuring them of a market. . .

EUGENE E. MANECK  
President  
Chemical Affiliates, Inc.  
New York

*We didn't intend, of course, to list all the firms doing recovery work. We mentioned only a few as examples.*  
—ED.

## Airplanes, Not Autos

TO THE EDITOR: Although pleased to learn that CHEMICAL WEEK considered Silastic Type K Interlayer worthy of editorial review (*CW*, Dec. 29, '56, p. 103), we were dismayed to note the significance placed on this new development as a possible boon to the automotive industry.

As you may recall, Type K is a transparent silicone rubber designed as a bonding agent for safety glass windshields for supersonic aircraft. The speeds at which some of these ships are designed to fly generate enough frictional heat to literally melt the conventional interlayer material, polyvinyl butyral.

So far, so good. But the story goes on to dwell on the possibility of this material in automobile windshields, saying that "electrically heated glass" for de-icing would require a heat-resistant interlayer.

Even granting the possibility of a salable "hot" windshield (useful two or three times a year), the melting point of ice is still about 33 F. To produce 33 F on the exterior of an auto windshield, it would hardly seem necessary to heat the interior much past 160 F—and it is only at this point that the advantages of the silicone interlayer even begin to become apparent.

Between a few degrees below zero and 160 F, conventional safety glass is not only somewhat clearer than the silicone laminate, but is far stronger. Admittedly, it does weaken rapidly above that point. At 200 F, the silicone is twice as strong, according to the Air Force, and at 300-350 F, polyvinyl interlayers literally bubble and ooze.

. . . But at what speed does a wind-

shield reach 300 F—or even 200 F? Well, the Air Force won't say, and the ratio is subject to a host of variable factors anyway. But it is known that:

1. The speed of sound, depending on altitude, air temperature, etc., is between 600 and 800 mph.

2. This speed has been exceeded repeatedly by planes with acrylic plastic "bubble" canopies.

In contrast:

1. The speed record for "automobiles" (John Cobb, Bonneville, 1947) is 394 mph.

2. The speed limit in the state of Michigan is 65 mph.

3. The automobile industry, perhaps because of their tendency to multiply every penny by a factor of 1 million, is notoriously cost-conscious.

[We have stressed] all these points. . . It is difficult, therefore, to see much justification for the statement that "Silastic is considerably more expensive, although this is relatively unimportant."

In addition, our colleague on the Type K windshield project, Libby-Owens-Ford Glass Co., has pointed out that your statement "safety engineers cite windshields as one of the three most dangerous parts on an automobile" is simply not substantiated by any of the existing data on motor vehicle accidents. . .

Certainly Type K is a genuine contribution to the continued development of high-speed aircraft. So far as we can determine, that's all it was supposed to be. I realize that your publication likes to explain and "interpret the significance" of the news, but this time it appears the interpreter was carried away by his own free translation.

J. H. O'NEILL  
Technical Information Service  
Dow Corning Corp.  
Midland, Mich.

CW Thanks reader O'Neill for his discussion of the uses for Silastic Type K Interlayer. However, CW's first intimation that the interlayer might find use in "hot" windshields that would combat winter fogging and icing came from a Dow Corning researcher. Source for the statements on windshield safety was a 1953 Army Ordnance Corps report on its Project TB1-1000, "An engineering pilot study to determine the injury potential of basic automotive interior design."—ED.

## MEETINGS

**American Pharmaceutical Manufacturers' Assn.**, Central section meeting, Edgewater Beach Hotel, Chicago, Feb. 11-13; Western section meeting, Ambassador Hotel, Los Angeles, Feb. 18-19.

**Technical Assn. of the Pulp and Paper Industry**, 42nd annual meeting, Hotel Commodore, New York, Feb. 18-21.

**American Management Assn.**, electronics-in-action conference, Hotel Statler, New York, Feb. 25-27.

**American Institute of Mining, Metallurgical and Petroleum Engineers, Inc.**, annual meeting, Hotels Roosevelt and Jung, New Orleans, Feb. 24-28.

**New York Board of Trade**, symposium on minimum care of wash-and-wear fabrics, Sheraton-Astor Hotel, New York, Feb. 28.

**Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy**, Penn-Sheraton Hotel, Pittsburgh, Pa., March 4-8.

**National Agricultural Chemicals Assn.**, spring meeting, Fairmont Hotel, San Francisco, March 6-8.

**New York Board of Trade**, 31st annual dinner of the Drug, Chemical and Allied Trades Section, Waldorf-Astoria, New York, March 7.

**Chemical Market Research Assn.**, theme: our next five years of competition with foreign chemical industry; Sheraton Hotel, Philadelphia, March 12-13.

**Nuclear Congress International Atomic Exposition**, Convention Hall, Philadelphia, March 11-15.

**National Industrial Conference Board**, 5th conference on atomic energy, Benjamin Franklin Hotel, Convention Hall, Philadelphia, March 14-15.

**Society of the Plastics Industry, Inc.**, annual national conference and Pacific Coast Plastics Exposition, Los Angeles-Biltmore Hotel and Shrine Exposition Hall, Los Angeles, March 18-21.

**Uranium Institute of America**, milling symposium, Grand Junction, Colorado, March 21-23.

**Council for Agricultural and Chemurgic Research**, annual conference, Congress Hotel, Chicago, March 26-28.

**Commercial Chemical Development Assn.**, plastics meeting, Statler Hotel, New York, March 27-28; resort meeting, French Lick, Ind., May 13-14.

**Illinois Institute of Technology**, 19th annual American Power Conference, Hotel Sherman, Chicago, March 27-29.

**Office of Naval Research**, colloquium on radiation effects, Johns Hopkins University (Shriver Hall), Baltimore, March 27-29.

# World's Largest Acetylene Plant

*from Natural Gas*  
(BASF Acetylene Process)

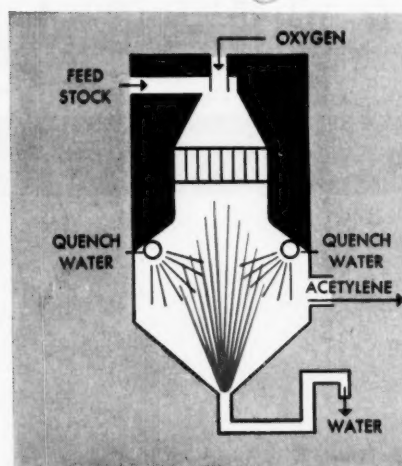
**ENGINEERED AND BUILT BY  
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The BASF\* Acetylene Plant of American Cyanamid Company at Avondale, Louisiana, engineered and built by CHEMICO, is now being increased in capacity, making it the **WORLD'S LARGEST ACETYLENE PLANT OF ITS TYPE.**

By 1957, all the plants engineered and built by CHEMICO for the production of acetylene from natural gas will have a total capacity of 150,000,000 pounds per year.

Important features of the BASF process are listed below, and reprints of article describing this process are available upon request.

\* Badische Anilin & Soda Fabrik, AG, West Germany, holder of the basic acetylene process for which CHEMICO has exclusive rights in all North American Countries.



## Features of the BASF Acetylene Process

Produces commercially pure acetylene, meeting specifications for the manufacture of acetylene derivative products such as Acrylonitrile, Vinyl Chloride, Methylstyrene, etc.

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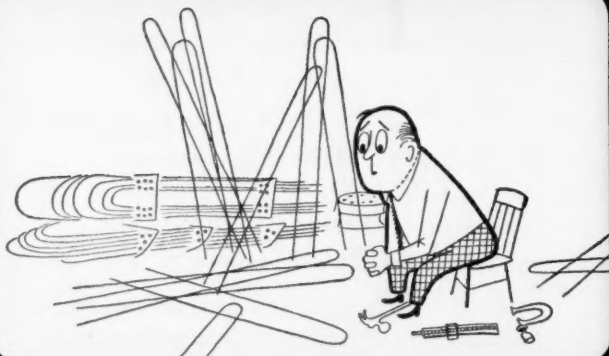
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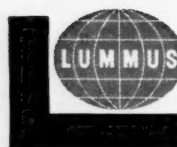
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# Business Newsletter

CHEMICAL WEEK  
February 16, 1957

Chemical companies are high on the list of firms now being consulted by Senate Antitrust and Monopoly Subcommittee economists. The purpose is to work out arrangements to get production and supply figures applicable to its upcoming study of economic concentration in U. S. industry.

The subcommittee, headed by Senators O'Mahoney and Kefauver, has been working on this investigation for about a year, and public hearings are still about six months off. In the meantime, the Bureau of Census, as requested, has prepared figures on industry concentration. Two staff economists, Jesse Friedman and John Skeen, have been analyzing and checking the figures with various company representatives. (Reportedly, more chemical firms have been contacted than have companies in any other single industry.)

Recent additions to the subcommittee staff, too, indicate the probe will be a full-dress affair. Among new personnel: John Bleir, who has been named chief economist for the group; Paul Rand Dixon, new cocounsel and staff director. Both have been with the Federal Trade Commission; Bleir played a big part in passage of the 1950 antimerger law.

•

Alcoa and National Lead agreed to pay a higher price for natural gas to the Arkansas Louisiana Gas Co. last week. The withdrawal of these firms, vocal in the fight against Ark-La's high-rate noninterruptible "Three-X" contracts—as well as in the fight against a general rate hike given the gas supplier in '55—now leaves only four of 11 firms still fighting the rate increases in the courts (*CW*, Feb. 9, p. 24).

•

Du Pont will up titanium dioxide pigment output with a new plant—its third—near New Johnsonville, Tenn. Producing pigment from ore from Du Pont's Florida ore holdings, the new plant has a capacity of 125 tons/day, will be in operation in early '59.

•

Add the threat of a dockworkers' strike to the woes that this week are confronting shippers using the nation's busiest port, New York.

Already crippled by a tugboat strike, New York would be hardest hit by a walkout of 40,000 longshoremen in ports from Maine to Virginia. Gulf port workers, who had joined in the nine-day strike last November, settled their differences during the period the Taft-Hartley no-strike injunction was in effect. It expired Tuesday night.

•

Internal Revenue Service disapproved the tax-carryover plans

## Business Newsletter

(Continued)

for Smith-Douglass' rejuvenation of Texas City Chemicals (*CW*, Jan. 26, p. 23). A revised plan, considerably reduced in scope, has now been put before the court in Texas City in the hope that S-D may still be able to get some use from the plant. But opposition to the new plan is building up.

### **Practical water-thinned, styrene-butadiene latex paints for metal?**

Leland Doan's casual remark—"application of latex paint technology to the field of metals is definitely within the realm of possibility"—made when he opened Dow's \$1-million latex plant in Pittsburg, Calif., last Thursday, gives a clue to future plans.

Dow is now offering paintmakers a special latex designed for use in coating metal. Formulations for both primer and glossy finish coats are offered; the paints are conventionally applied, and are baked in conventional equipment.

Low fire hazard, a hard, adherent finish, and low cost are among the advantages of the new paints, which are already offered in experimental quantity by some paintmakers. But early formulations lack high gloss; too, the color retention—a quality noticeable in light colors—seems to be poor.

**A dry, granular polyester molding power** will be marketed this fall by Hooker Electrochemical Co.'s Durez Plastics Division.

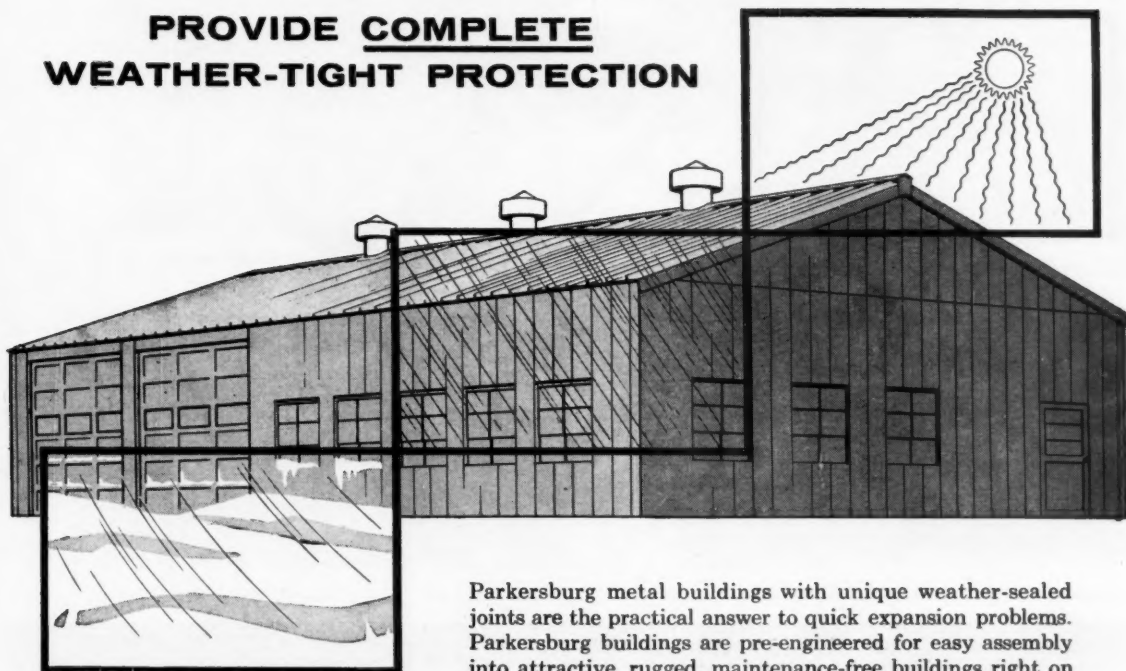
Hooker's building a \$500,000 plant in North Tonawanda, N. Y., to make the new material.

Heretofore, the polyesters have been available to molders as pasty semisolids or in large chunks; in spite of handling difficulties, however, their heat-resistance, durability have earned them numerous jobs. Light colors are featured in the new Durez line, and though the resins are higher priced (at 42-77¢/lb.) than dark-toned phenolics, they will be competitive with the other currently available resins used for colored moldings—the melamines, urea formaldehydes. Durez, which has concentrated on phenolics, has not so far made a resin suitable for marketing in pastel shades.

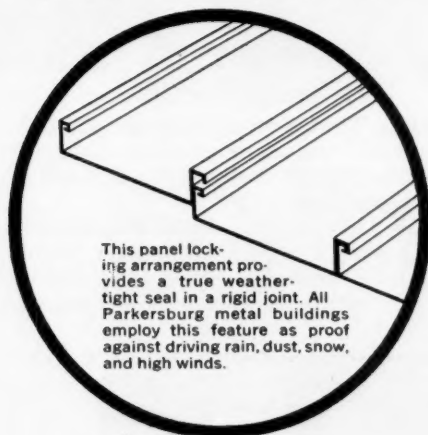
**Polyurethane molding resins** are considerably farther from commercial stage. But Mobay has them—hard, nylonlike materials. The melt range for Multrathane is beneath that of nylon; it has somewhat higher moisture-resistance. A price of \$2.70/lb. is currently quoted for imported material—and only milky-colored types are now offered. The polyurethane pellets, though, can be used in virtually any type of standard molding equipment.

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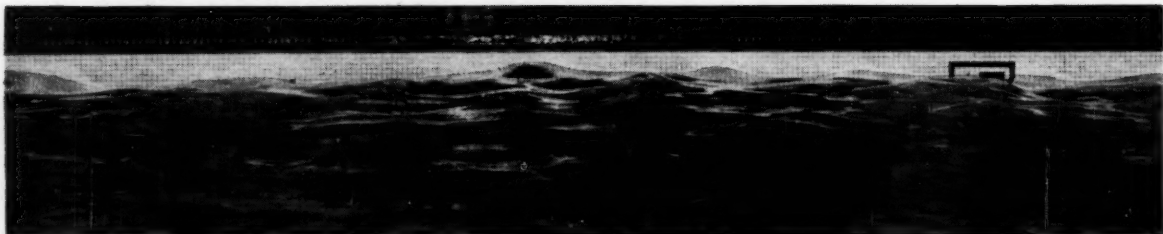


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Industrial Stock Prices      Falling Slowly



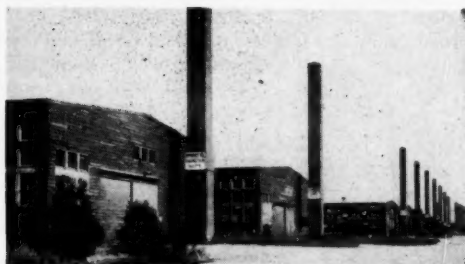
New Orders for Durables      Rising Steadily



New Incorporations      Falling Slowly



Average Workweek      Rising Slowly



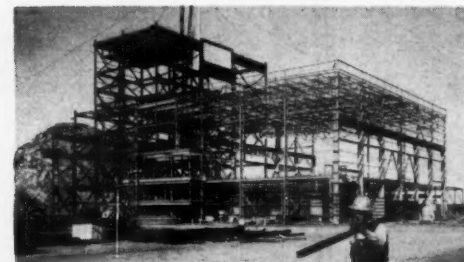
Business Failures      Slowly Increasing



Commodity Prices      Rising Steadily



Residential Building      Down Considerably



Nonresidential Building      Rising Slowly

## Eight Indexes: Can They Show the Future?

The business indicators illustrated above are being carefully watched by economists and executives who hope to get an advance tip-off on what's ahead for

business. With four trending down and four going up, the people who favor this prediction system are uncertain. Do process industry executives join them in

their uncertainty? Generally, no. Chemical management, like many others, is on the bullish side. Right now, the pessimists, who expect a business downturn, are in the minority. Though some people think the boom is leveling off, it's with the many who look for a continued mild rise in business activity that process management is standing up to be counted.

Talk of a downturn in business isn't being taken too seriously.

To be sure, no one's ignoring statements such as that made by former President Herbert Hoover last week when he said he believes he "can detect the signs" leading to a downturn. For the most part, chemical business planners contacted by *CW* say that when and if such signs exist, it's management's job—and government's too—to bolster weak spots.

**Blowing Straws:** In the financial mart, where much of the hardest worrying is being done, analysts are looking at various indicators for a clue. Some leading economists\* believe the eight factors illustrated (*on p. 21*) to be the most consistent pace-setters of both recession and revival—and they're now cited by some Wall Streeters as evidence of an approaching economic sag.

Indeed, at least one investment house (thought to be among the most consistently "bearish") is already re-

\* Among them Wesley Mitchell, Geoffrey Moore and Arthur Burns (the former chairman of the President's Council of Economic Advisors).

shaping its investment policy to step up purchases of preferred stocks and bonds as retrenchment. A vice-president of this firm says he'd be "awfully surprised if we could go another two years without a recession."

**Pooh-Pooh:** But talk to management in the chemical business and their view is a lot different. Many agree that the straws-in-the-wind guides show, at the worst, a drifting economy—business at a plateau. Moreover, most think that the plateau would be only the tread before the riser—a level spot preceding a new step upward.

Chemical process management sees steadily rising sales in 1957 and is optimistic that profit margins are due for an increase over their generally poor showing in 1956. And in this latter situation, business economists see a key to the pessimistic thinking in some quarters.

They believe that the squeeze on profits has caused some Wall Streeters to pull back investments in common stocks for what are now more desirable yields from preferreds and bonds. (This has been true, in fact, in the case of some chemical stocks.) This transfer, in turn, has generated talk of declining business.

But, says the economist of one of the largest chemical process companies, the view of such an investor is generally based on short-run gains and a desire for a fluid portfolio. Thus, such a security man would tend to pull out quickly from a company whose stock

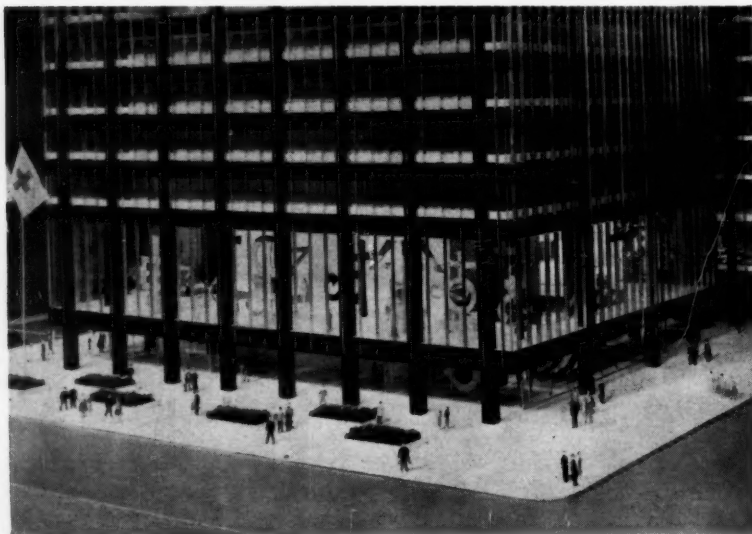
yields were even momentarily on the decline.

**Cutbacks:** One of the most talked about current manifestations of boom-leveling is an apparent cutback in capital expenditures. Often cited are the deferral of four projects by General Electric, a similar move by General Motors, and some scattered curtailments by small and moderate businesses; too, there are comments about "austerity programs" being instituted by a number of larger companies with regard to approval of capital expenditures.

But most of these retrenchments can be traced back to the tight money supply. Says a vice-president of one moderate-size chemical firm, "Sure, we've cut back on some capital programs we had on paper, but it's only to conserve our cash."

**Heart of It:** Biggest worry of all, and one that's been reflected rather strongly in President Eisenhower's Economic Report to Congress, is inflation. The upward push on costs and prices is bothering everyone. But both chemical management and the President agree that alert management of both public and private business can do much to control this.

What's the outlook chemical process men see? Continued pressure from inflation, a need to keep finances liquid, and a bright business picture for 1957. If business doesn't hit new records, it will at least stay at the present high plateau.



## More Space for Growth

Newest evidence of growing chemical companies' need for space is the plan for a 52-story office building to be built by Union Carbide. Details of the structure were outlined last week.

UCC's executive offices will use a large portion of the building, which will be located on New York's Park Avenue. For some years, the company has had to split its home-office forces among several New York office buildings—thus often making interdepartmental communication difficult.

The building will have a stainless steel and glass front rising from a landscaped street level plaza. Because the railroad tracks are located beneath the building, its main lobby will be on the second- and third-floor levels.

## New Hope for Plant Sale

After three years of unsuccessful attempts to get rid of the U.S.-owned butadiene-from-alcohol plant in Louisville, Ky., Congress is considering a new, more liberal plan for disposal of the plant. Last week the House okayed a bill removing the plant from the wartime synthetic rubber reserve. Still ahead is approval by Senate committees and the full Senate.

A significant part of the new plan, proposed by the House committee (*CW Business Newsletter*, Feb. 2), would permit sale of the plant to a company that would convert it for the manufacture of any chemicals fitting into the government's mobilization base—i.e., any material on which a fast tax write-off has been granted.

There's a much lessened chance of conflict with antitrust laws under the new proposal. Though the Justice Dept. will still be requested to give its views on competitive effects of the sale, an adverse finding would not automatically veto the sale, as occurred on one past occasion.

Other factors that are expected to promote the plan's chance for Congressional okay:

- Complaints about present and prospective costs of maintaining the plant. Since April '55, the government has paid out \$377,168 in maintenance charges and taxes, received only \$137,702 in rent and production royalties. Under present shutdown conditions, say supporters of the plan, the government can expect to put up \$342,000/year to maintain an idle facility, at least until 1958.

- Assurance for the nation of a more-than-adequate supply of butadiene—without Louisville's potential 90,000 tons/year. The Office of Defense Mobilization says present and planned capacity will total 1,037,000 short tons/year by early '58—exceeding all prospective government estimates of emergency requirements.

The new proposal has created a lot of interest among private industry. At least 18 companies are investigating possible purchase, and all have the technical and financial ability to swing such a deal.

Any sale negotiated after passage would be subject only to Publickers Industries' current lease—unless Congress vetoes it within 30 days after its submission for approval.



PUERTO RICO: Vigorous campaigning aims at new industry.

## An Island's Chemical Plans

Petrochemicals have moved into first place as the fastest-growing industry in Puerto Rico. And U. S. chemical process firms are in the vanguard of the growth.

These are the highlights of a new survey just completed for *CW* by the territory's Economic Development Administration. It's the island's hope that the fruition of plans now under way will culminate in a "billion-dollar petrochemical-refinery complex by 1970."

Basis for EDA's optimism is the ever-growing number of petrochemical projects in the blueprint stages, already under construction or about to go onstream. Largest of these is Union Carbide's \$28.5-million ethylene glycol plant at Guaynilla, where first construction activities are just now beginning. Carbide's total investment is expected to go to \$60 million when sufficient markets develop for other ethylene-derived products.

Fifteen miles to the west, in the town of Guanica, Gonzales Chemical Industries is making test runs on its new \$12.3-million ammonium sulfate plant. This week, the plant goes fully onstream to produce 120,000 tons/year of ammonium sulfate and 115,000 tons/year of sulfuric acid.

Nearby, Commonwealth Oil is in the midst of a \$15-20-million expansion program to add units that will supply ethane, ethylene, methane,

hydrogen, propane and propylene to the Union Carbide plant. In return, Commonwealth will get scrubbed-out hydrogen sulfide from Carbide for processing into sulfuric acid, as well as tail gases, which can be used either as fuel or for possible production of ammonia. The company expects to have a \$45-million investment in the location by '58.

Meanwhile, a third, even larger refinery is planned for the south coast region. It's expected to materialize by the end of '57.

**Other Bids:** The island's also bidding for, and getting, other segments of the chemical processing industry. Synthetic fiber production is another big goal for development. The commonwealth, EDA officials state bravely, hopes to have at least two 20-40-million-lbs./year fiber plants producing by 1965.

In all, there are 30 U.S. chemical affiliates now producing in Puerto Rico. Most are small compared with parent companies—but their earnings averaged 31% of sales in 1956, in contrast with the 8% for similar products from U.S.-based plants.

Parts of this record, of course, can be attributed to freedom from federal taxes, lower labor costs and 10-year local tax exemptions—items EDA hopes will speed American chemical capital southward at an even more rapid rate.



## Pipeline Gets Go-Ahead

**Intensified chemical development** along the northern U.S. border is being looked for, now that financing arrangements have been approved for Trans-Canada Pipe Lines, Ltd.'s 2,200-mile natural gas pipeline.

The line will extend from mid-Alberta to eastern Canada (see map) via Port Arthur at the lakehead, and via the Toronto area. Enroute, it will carry natural gas to many areas of Canada.

**Tap-Offs:** A significant section of the construction permit authorized for the project will allow a 49-mile spur to be built from Winnipeg to Emerson, near the North Dakota-Manitoba border. Most recent plans call for Tennessee Gas Transmission Co. to tap supplies from the main line at that point for delivery to United States customers.

At a point near Hamilton, Ont., too, Union Gas Co. is planning to pipe gas down to Sarnia, Ont., rapidly expanding petrochemical center. U.S. firms reportedly are already studying the possibilities of greater investments there.

**Schedule:** As it stands now, Trans-Canada hopes that by the end of this summer it can complete the line from the Princess gas field near Calgary, Alta., to Winnipeg. From Winnipeg, the company would press on to Port Arthur, Ont., by the end of 1957. Last step—extending the line from Port Arthur to Montreal—would

be completed late in 1958. The construction permit sets Dec. 31, '58, as deadline for completing the entire line.

Financing plans for the \$370-million project include selling \$104 million worth of first-mortgage bonds, \$112.5 million of common stock and debenture certificates, and obtaining a \$20-million loan from four U.S. banks. In addition, company sponsors have already bought up \$15.5 million in common stock, and the Canadian and Ontario governments will invest an-

other \$120 million in a portion of the project.

Prospects are claimed to be excellent for gas consumption in those parts of Canada that will be served by the line. According to the company, the Canadian market promises to use at least 180 billion cu. ft. of gas yearly by the fifth year of operation.

The outlook for investment in operations dependent on the pipeline is equally bright, say company officials. The firm has direct knowledge, it claims, of over \$100 million worth of expansion and new building that would be initiated as soon as natural gas is available.

## New Water Measures

**Water supply and control measures are being pushed by at least seven chemical processing states, a CW survey shows.**

Almost ready to bridge the gap between study and implementation is the California program. Gov. Goodwin Knight, in his message to the convening legislature, said the time has come for "actually undertaking proposed projects." He is seeking immediate appropriation of \$63.2 million for the Oroville Dam of the Feather River project—a program to haul northern California water as far south as the Mexican border.

He has also called for a long-range water-development fund, and a constitutional amendment that would settle a controversy over rights to

water originating in the North but used in the South.

Amendments to the Texas constitution would permit the state to issue \$100 million in bonds for loans to finance city, county and state water-supply projects.

Also proposed is a use-tax of 1¢/acre-foot on water diverted from surface streams by manufacturers, and 10¢ an acre—regardless of volume involved—on water claimed under a diversionary right for irrigation.

Both amendments would provide for creation of a state water-development board to administer the program.

**First Steps:** Oklahoma, North Carolina and Florida legislatures are considering proposals for development and control boards to study water-conservation programs. These studies

## Washington Angles »

» **Resumption of federal mineral subsidies** on fluorspar, asbestos, tungsten and columbium-tantalum, under the government's stop-gap stockpiling program, probably hinges on a compromise to be worked out by House-Senate conferees.

The \$21 million voted last year for stockpile purchases of the materials has run out, and last week the House struck from a catch-all appropriation bill, being pushed through Congress to meet urgent needs, the Administration's request for another \$30 million for minerals purchases. Odds favor the Senate's restoring the funds, leaving it up to a conference committee to settle the question.

**Outcome may provide a clue to how Congress will react to the Administration's request for \$40 million to finance the program in fiscal '58—as well as the reception that will be accorded long-term mining policy recommendations due soon from Interior Dept.**

» **Two ideas to stimulate technical studies** were tendered in Washington last week:

- Rep. Melvin Price (D., Ill.), of the Joint Congressional Atomic Energy Committee, introduced a bill

that would provide a \$500 federal scholarship to every high school senior who passes a special examination in basic mathematics—with an additional \$500 grant to those who go on to college and complete a course in calculus.

- The Manufacturing Chemists' Assn. said it will present special awards to six "outstanding" college chemistry teachers handling undergraduate courses.

» **Should alcohol from surplus crops be used** by industry and for blending with gasoline? Yes, say Sen. Karl Mundt (R., S. D.) and Rep. Ben Jensen (R., Iowa), who predict an intensive study of the matter.

They have indicated that the President's Commission on Increased Industrial Use of Agricultural Products will "explore every factor and facet" of the possibility of using the surplus.

Both lawmakers appeared before the commission to push the plan, which would probably involve some form of federal government requirement or encouragement to use blends. Mundt points out that some of the possibilities include "tax incentives, initial government subsidies or across-the-board requirements for blending of gasoline used in interstate shipments."

would provide the basis for fundamental policies regarding water conservation and development.

In New Jersey and Arkansas, attention is being given to proposals for increasing water-storage facilities. New Jersey's Governor Meyner is anxious to begin construction of a reservoir in Round Valley in Hunterdon County.

The Arkansas plan, proposed by the state water study commission, would include a surface-water regulatory bill, encourage increased building of dams.

## FOREIGN

**Fatty Acids/Belgium:** Archer-Daniels-Midland Co. (Minneapolis) and Palmatina Co. (Brussels) will build a jointly owned oleo-chemical plant in Ertvelde Rieme, Belgium. The new unit will produce fatty acids and their chemical by-products.

• **Neoprene/Ireland:** Du Pont Co., Ltd., British affiliate of the American firm, has received approval of financing plans from the Bank of England and the Capital Issues Committee for its neoprene synthetic rubber plant slated for Londonderry. Construction

will get under way by mid-'57. Carbide Industries, Ltd., subsidiary of British Oxygen, Ltd., is blueprinting an acetylene unit in Londonderry that will supply Du Pont's new plant. Work on the Carbide unit is slated to begin within the next year.

## EXPANSION

**Potash:** First mining shaft for developing Farm Chemical Resources Development Corp.'s 15,000 acres of potash deposits near Carlsbad, N.M., is about to be drilled by Mackenzie and Whittle, Dallas construction firm. FCRDC, jointly owned by National Farmers Union, Kerr-McGee Industries Inc. and Phillips Petroleum Co., is negotiating for a 1,000-tons/day potash and by-products processing plant to be built nearby.

• **Alum:** Allied's General Chemical Division is blueprinting an alum soap plant near Pine Bluff, Ark. Output from the unit will go to two newly planned kraft paper mills to be built in the Pine Bluff area by International Paper and Dierks Co.

• **Ammonia:** Quebec Ammonia Co. will build a \$9-million plant near

Brockville, Ont. The Canadian firm recently purchased a 90-acre site.

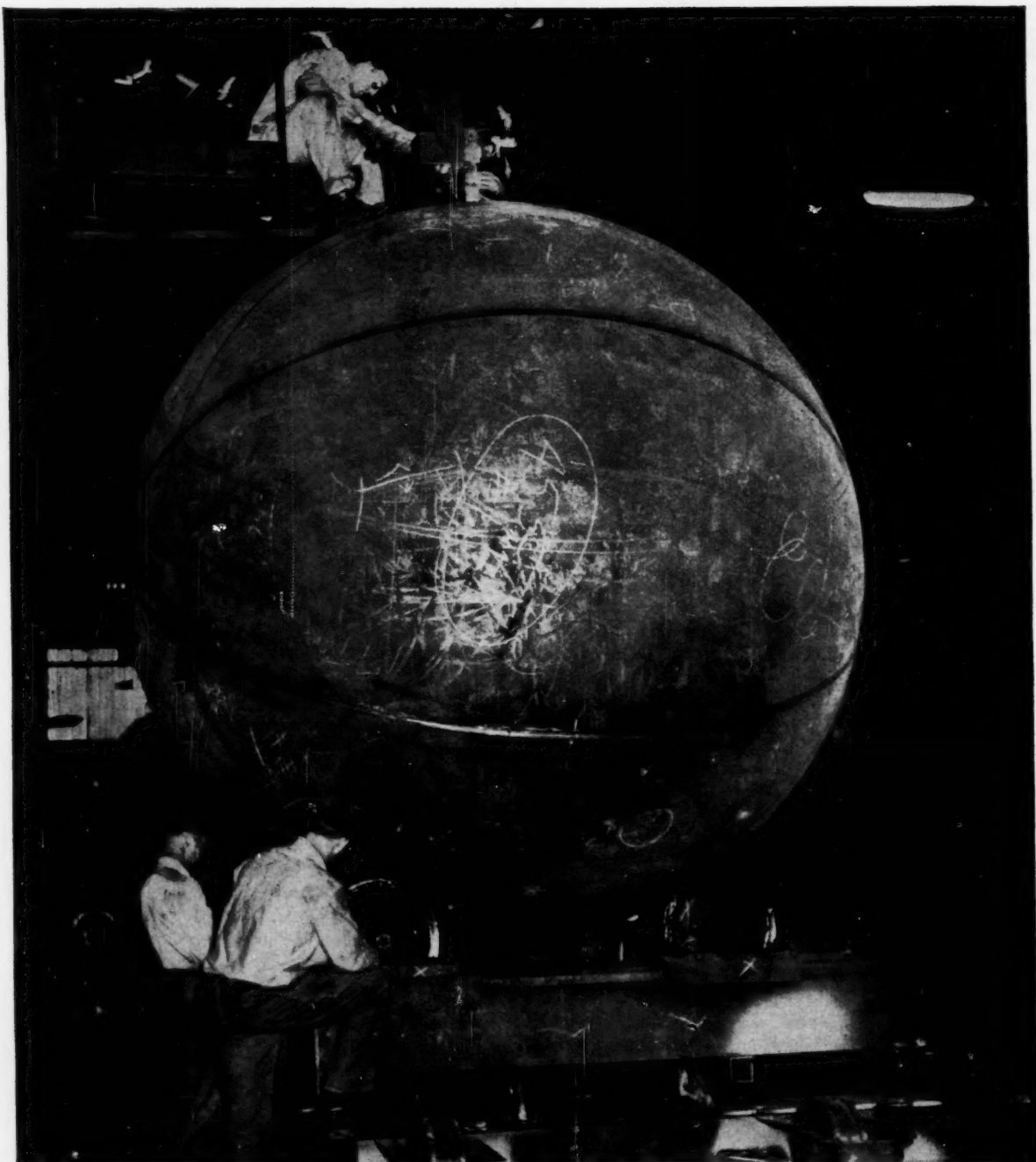
• **Oxygen:** Linde Air Products Co., division of Union Carbide of Canada Ltd., will put up a \$3-million oxygen plant at Sault Ste. Marie, Ont. The new unit, capable of turning out 150 tons/day of 99.5% oxygen, will supply Algoma Steel Corp., which is expanding its steel-making capacity.

• **Paper:** Weyerhaeuser Timber Co. (Tacoma, Wash.) is planning to build a \$30-million paper mill on a 410 acre site near Columbus, Miss. The West Coast lumber firm, too, has optioned 90,000 acres of forest land in east Mississippi from Mississippi Pulp & Paper Co.

## COMPANIES

• **Verona Dyestuffs** (Rock Hill, S. C.) has acquired all the outstanding stock of Pharma Chemical Corp.

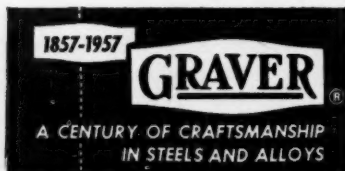
• **Allied Paper Corp.** (Chicago) will merge with APW Products Co. Inc. (Albany, N.Y.). Terms call for one share of Allied to be exchanged for 11 of APW. Total outstanding stock of the Albany firm: 269,525 shares.



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# ADMINISTRATION

## Diversity Is the Rule in Process Companies' Stock Plans<sup>†</sup>

Type of plan	Number of offerings	Intended mainly for:		Price of stock relative to market value:					Method of payment:		
		Officers and key employees	Employees generally	100 %	95 %	85 %	75 %	Stated amount	Gift	Lump sum	Instalments or payroll deduction
Stock option plans	77	66	11*	15	45	6	0	11	0	70	7
Stock purchase plans	24	9	15	4	2	3	0	15	0	2	22
Stock bonus plans	13	8	5	0	0	0	0	0	13	—	—
Stock and savings plans	4	0	4	1	0	0	3†	0	0	1	3
Totals	118	83	35	20	47	9	3	26	13	73	32

† Employee stock plans offered from 1947 through June '56 by chemical process firms listed on the New York Stock Exchange.

\* One plan for "employees other than executives"; 10 plans for "employees," not necessarily including "all employees."

† Two plans involved company contributions of unspecified amounts, arbitrarily taken to be approximately 25%.

## How Companies Help Employees Invest

Employee stock ownership plans have been frequently sampled but seldom adopted for steady use in the chemical process industries.

This is the import of a new New York Stock Exchange report on stock plans offered to employees between Jan. '47 and June '56 by companies listed on the exchange. Among them are 118 offerings by 72 chemical process concerns—including eight of the top 10 industrial chemical producers.

Dow and Du Pont together, accounted for 15 of these offerings—offerings that involved sale of 2.6 million shares of stock. In all, the 72 process companies—using 18 types or modifications of stock ownership plans—made available to their employees a total of 17.7 million shares of common stock, 20,000 preferred shares, and \$4 million in debentures convertible to common stock. Most of the shares were snapped up promptly, and in many cases employee stock holdings have been augmented by stock splits and stock dividends.

**Works Both Ways:** Employees of chemical process firms thus hold a significant and increasing block of

shares in the corporations they work for; and this situation can be expected to influence the actions of both employers and employees.

David Hill, president of Pittsburgh Plate Glass Co., says his company's experience confirms that stock ownership "creates in employees a personal interest in the corporation's welfare and provides an added incentive to do their utmost to advance the interests and welfare of the corporation." He also finds that a stock plan can be "of material assistance in recruiting and retaining employees."

On the other hand, chemical companies that have encouraged their executives and other employees to invest considerable sums in company stock are going to be more employee-conscious than ever before. To Dow President Leland Doan, adoption of an employee stock plan means that management incurs "a high degree of moral responsibility to formulate a program that will hold risk to a minimum." At the same time, Doan feels that the high degree of participation by Dow's employees in its stock offering has—in a considerable mea-

sure—been due to "the fact that our stock has behaved historically as a growth security."

**Chiefly for Chiefs:** Most of the process companies' stock plans and an overwhelming proportion of the stock involved have been intended for officers and key employees. Reasons for this are apparent: A company has more stake in key employees, individually, than it has in other workers, and naturally wants those key employees to feel that they have a big stake in the company's performance. Too, higher-income employees are usually more eager and better able to invest in stock. A more recent consideration is a National Labor Relations Board ruling—upheld in the courts—that a company's offer to issue stock to rank-and-file employees can be subject to collective bargaining.

But in a foreword to the stock exchange report, G. Keith Funston, president of the exchange, seems to plug for more offerings to employees generally. Such plans, he says, "are proving highly effective in giving more and more Americans a direct ownership in our business system—bringing

## ADMINISTRATION

us nearer to a true economic democracy."

**SOP vs. SPP:** Among chemical process companies, the favorite plan has been of the stock-option type, intended primarily for officers and key employees. Price of the shares under this plan are usually fixed at 95% of market value, and lump-sum payment is commonly required.

Stock purchase plans are favored when the eligible purchasers include rank-and-file employees. Price per share has sometimes been fixed at lower levels than under option plans, and only two of the purchase plans have called for lump-sum payment.

Du Pont's seven stock plans during the period called for granting of bonuses to certain employees (up to 7,800 in the latest plan). Part of each bonus was applied to immediate purchase of Du Pont common stock, issued at about the prevailing market price.

Minnesota Mining & Mfg. Co. concludes that "the principle of stock ownership is a sound one," and proprietary-drug-making Plough, Inc., states that employee ownership of company stock "is an integral part of our industrial relations program."

But in the main, process companies have used employee stock plans sparingly over the past decade. Management thus implies agreement with Doan's observation that a stock ownership plan is not necessarily good for every company or for any one company under all circumstances.

### Popular In Plush Years

*(Number of employee stock plans offered by process companies listed on New York Stock Exchange)*

Year	No.
1947	1
1948	2
1949	7
1950	6
1951	16
1952	28
1953	12
1954	14
1955	20
1956 (first 6 months)	12
Total	118

## FOR COORDINATED BARGAINING

(Multiplant councils organized to date by OCAW)

### Industry Councils

- Atomic Energy Workers Council
- Corn Council (covering wet milling and refining plants)
- Drug, Pharmaceutical & Cosmetic Industry Council
- Lead and Zinc Industry Council
- Paint, Varnish & Lacquer Industry Council

### Company Councils

- Allied Chemical & Dye Council
- American Cyanamid Council
- Koppers Co. Council
- Merck-Sharp & Dohme Council
- Minnesota Mining & Mfg. Council
- National Lead Council
- Union Carbide and Carbon Council

## Joint Action in Bargaining

**Issues behind** the concurrent strikes at four plants of Union Carbide and Carbon's Linde Air Products Co. Division by locals of Oil, Chemical & Atomic Workers (AFL-CIO) may have more management impact than just the crimping of output at steel mills and other industrial plants that depend on Linde for tonnage oxygen.

While OCAW spokesman say that wage rates, pure and simple, are the issue for which the strikes were called, Linde management has its doubts. Linde suggests that OCAW leaders—who have been saying that multiplant bargaining is one of their chief goals—may really be trying to get Linde to accept such negotiations.

Though this is denied by George Cowart, OCAW district director at Niagara Falls and coordinator of OCAW's Union Carbide and Carbon Council, his reply serves to illuminate OCAW's current stand on this controversial employee relations question.

In brief, OCAW leaders hold that company-wide bargaining should be used right now on such matters as pension and insurance plans, and that multiplant bargaining should eventually come into play on wages and hours. This is a function of the presently extant multiplant OCAW councils (see chart), and will be a function

of others now in the process of formation.

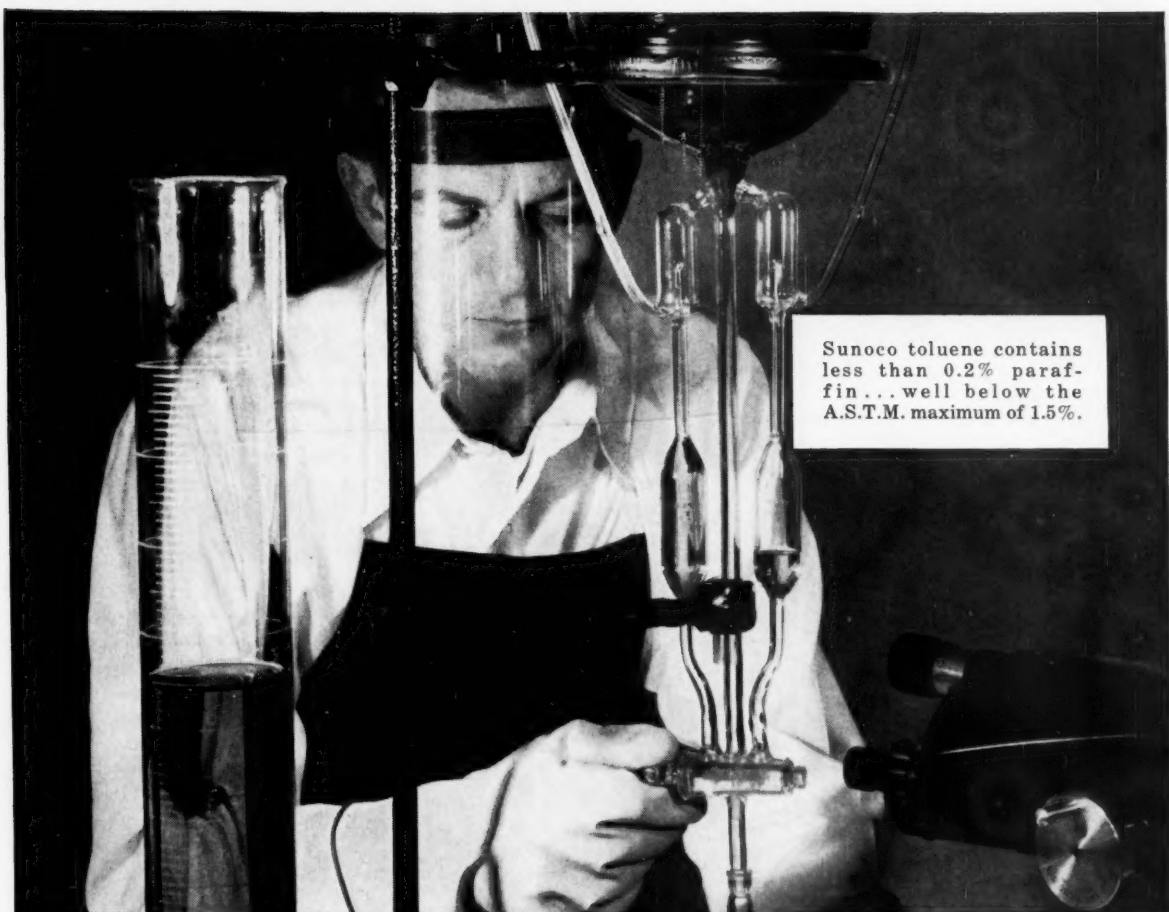
**Standstill with Linde:** As of last week, the OCAW-Linde wage dispute was at a standstill, with no new bargaining meetings scheduled. Linde was rationing oxygen to customers in some areas, also was asking the National Labor Relations Board to take action against the striking local in Kittanning.

The company's unfair labor practice charge accuses the local of refusing to bargain. At Denver headquarters, OCAW spokesmen told *CW*: "Of course we deny any such charge, and will fight it."

**Concerted Action:** While insisting that multiplant bargaining is not being sought in this case, union leaders concede that a form of concerted action is involved:

"It's the duty of the union for all to work together, and the international will help locals, as locals are expected to help the international." The union is asking 20¢/hour; Linde is offering about 12¢.

For process management, one point to be noted in the OCAW-Linde spat is the possibility that single-plant contracts with the same termination date might be used as a step toward multiplant bargaining.



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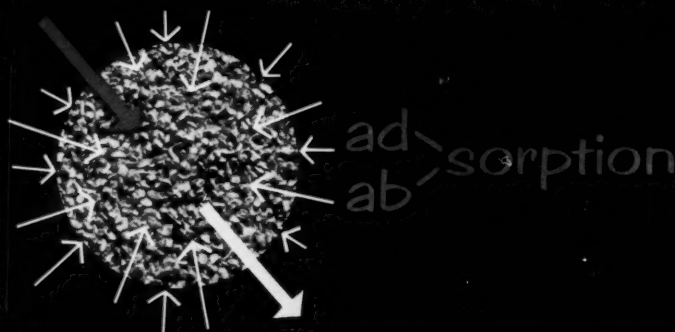
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## ADMINISTRATION

### License or Sell?

Patent sellers can throw away 25% of the sales price as quick as a wink, if they don't call in their tax experts early enough.

This warning comes from Everett Ungemach, tax department supervisor for the chemical divisions of Food Machinery and Chemical Corp. The important thing, he says, is to shape transactions in such a way that the proceeds from the patent sale are taxable as capital gains instead of ordinary income.

But for the purchaser of a patent or know-how, the best bet is to acquire the patent in such a way as to make the cost deductible over the shortest possible period.

Tax regulations make a sharp distinction, the tax expert says, between selling and licensing a patent. Profits from the former transaction are usually taxed as capital gains at 25%. Licensing profits are taxed at 52% as ordinary income. To make sure transactions fall into the proper classification, Ungemach suggests the following guides:

- Exclusive rights to make, use or sell the patent should be transferred. Failure to transfer a major right will result in a license classification. The substance of the transaction—the courts have said—not the language, governs whether it is classified as a sale or license.

- Less than an entire patent can be transferred, or exclusive rights within a specific territory can be awarded, and a sale will result in both instances, provided an undivided part interest is granted in the first case, and the territory is of sufficient size in the second instance.

- It's best to receive payments for a patent in a lump sum in order to establish outright sale, but installment payments on a fixed or production basis can be made acceptable. The payment period, however, should be substantially less than the remaining life of the patent.

Although the courts have said from time to time that the method of payment does not alter the capital gains status of a transaction, the Treasury Dept. took the position in 1950 that installment payments—those that are based on use of the patent or over its life—constitute royalties, not proceeds, of a sale.



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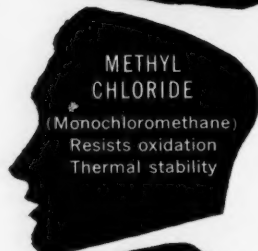
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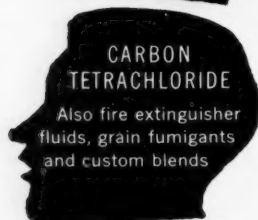
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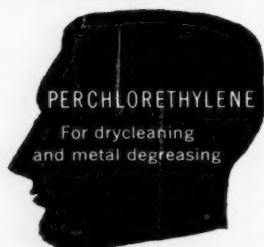
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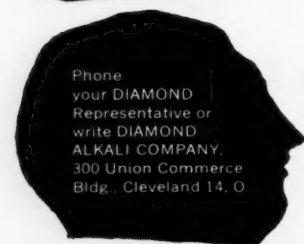
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## ADMINISTRATION

### Antidump Fight Looms

The U.S. Treasury Dept. last week fired the opening shot of what may well be the second hottest Congressional battle this season in the foreign trade field.

The shot likely to be heard around the country: a Treasury report to Congress on proposed changes in the Antidumping Act of 1923, a law that's of substantial concern to U.S. chemical producers. The report cautiously ducked the main controversial issues and contented itself with recommending minor technical changes—unifying the standards used for determining the existence of dumping and making it possible to take quantity of shipment more fully into account.

Congressional hearings are almost certain to be held on the act this spring, and the intensity of the debate is expected to be second only to that of the clash between protectionists and freer traders on the Organization for Trade Cooperation.

Both importers and such high-tariff groups as the American Tariff League are girding to press Congress for radical revision of the act.

## LEGAL

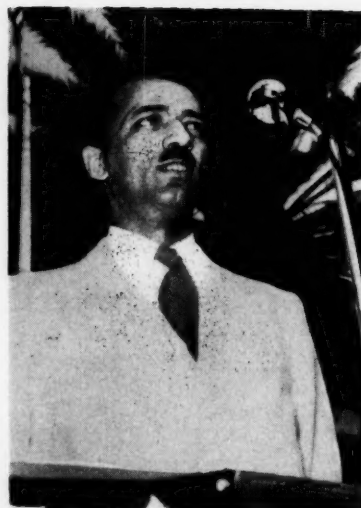
**Plastic Containers:** Two recent and unrelated developments have left polyethylene container manufacturers with problems that may well affect future management decisions.

- The U.S. circuit court of appeals in Philadelphia has upheld a lower-court decision affirming that Lamex Chemical Corp. (Manchester, N. H.) did not infringe on patents held by Plax Corp. (Hartford, Conn.) for the manufacture of polyethylene bottles.

- And, almost simultaneously, police and safety authorities in Rochester, N. Y., issued a warning urging extreme care in the use of certain new plastic containers that hold sulfuric acid for use in "instantaneously" charging automobile batteries. This warning may be only the first of many.

In the appeals court opinion, Justices John Biggs, Herbert Goodrich and William Hastie said that of the two process patents held by Plax, only one is valid and that one was not infringed by Lamex.

Previously, a federal district court had ruled both Plax patents valid, but not infringed by Lamex. Plax



**JUDGE HASTIE:** He found differences in mechanics, not in process.

appealed the noninfringement decision, and Lamex appealed the validity ruling.

The court of appeals found the two patents held by Plax "decidedly similar" and said the steps involved in the second patent constituted "a difference in mechanics rather than a difference in process."

Authorities in Rochester issued their warning after a number of service stations reported incidents in which men spilled acid on their hands and clothing. According to the officials, one type of container cannot be emptied without spilling acid.

William Keeler, director of the Rochester Safety Council, sent several containers to the National Safety Council in Chicago, which plans a national study of the problem. Other action has been requested from federal authorities and from battery manufacturers.

- **Warfarin in Japan:** The Japanese Patent Office Tribunal has ruled in favor of the Wisconsin Alumni Research Foundation's patent on its process for making warfarin.

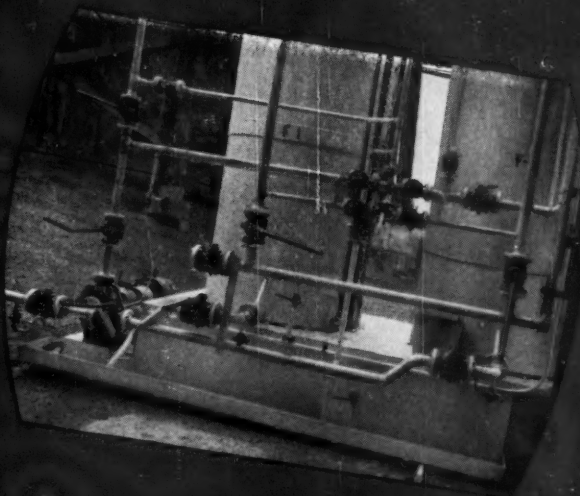
Toko Chemical Co. Ltd. (Tokyo) had sought a declaration to the effect that its process for making warfarin was outside the foundation's patent, but the tribunal ruled that the Japanese firm's process involved steps that were a part of the foundation's patented manufacturing procedure.

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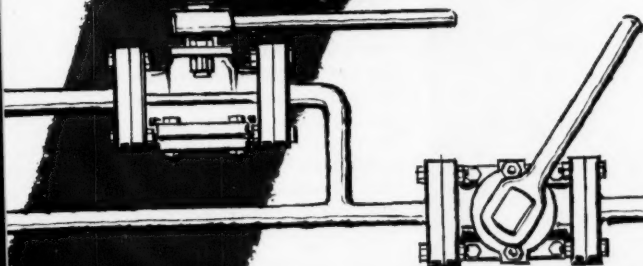
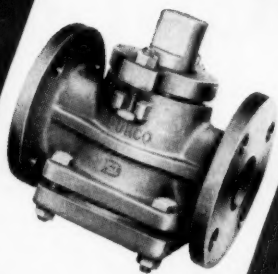
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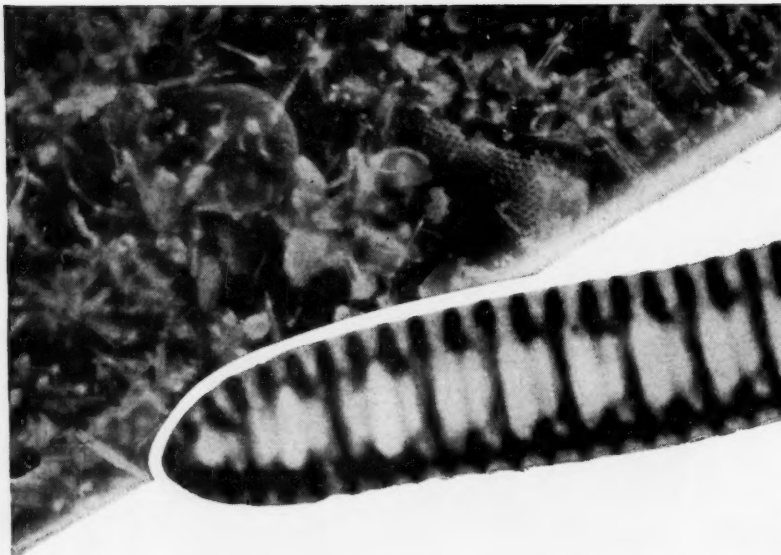
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This is a "Plagiogramma," just one of hundreds of intricate particles that, together, make Celite diatomite such an effective filtration aid. Under the microscope, this "Plagiogramma" became a "caterpillar."

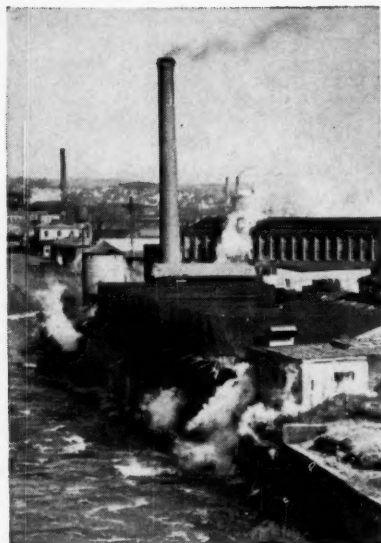
*What's this "caterpillar" got to do  
with lower filtration costs?*

# It's a particle of CELITE that covers more



## **Assures highest purity in pharmaceuticals**

Among the many important uses of Celite diatomite filter aids in industry today is the vital part they play in the production of life-saving antibiotics. Not only does Celite safeguard the purity of aureomycin, streptomycin and other pharmaceuticals; they also provide substantial cost savings that permit wider usage of these wonder drugs.



**Protects communities from contaminated plant waste**

Celite helps control pollution through removal of suspended solids from plant waste waters. Celite treatment often permits plants to reuse this water.



**Provides greater clarity in varnish, lacquer and shellac**

Celite filtration provides the high degree of clarity required in clear finishes. Celite is also widely used by the paint industry as a flattening agent and pigment extender.



**Gives appetizing sparkle to syrups, jellies and other foods**

Many food processors make an important *sales plus* of the outstanding brilliance that Celite provides. Celite also helps increase juice yields as a pressing aid.

# -the diatomite filter aid filter surface per pound

THAT'S RIGHT. Celite\* is the diatomite that gives you superior clarification at fast flow rates PLUS lower wet density. And lower wet density simply means greater surface coverage per pound of Celite. Which means substantial savings to you, for 6 bags of Celite will actually do the work of 7 bags of other diatomites.

And Celite is uniform. Every pound of it comes from Lompoc, California, the world's largest and purest diatomite deposit. Here, J-M technicians process and grade it so that no matter which convenient J-M warehouse you order from, the physical and

chemical properties of each grade will never vary.

In addition, from Celite's full line of filter powders you can select the one grade that will give you the clarity you need at the highest flow rate.

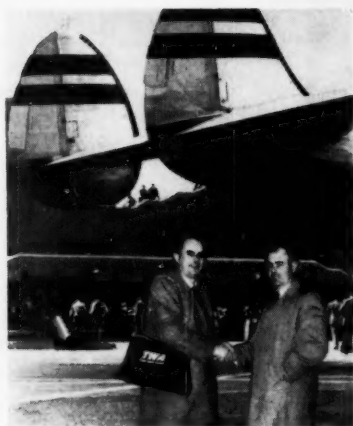
So if filtration belongs in your processing operations, it will pay you to call in your local J-M Celite engineer. Backed by Johns-Manville's research facilities and years of practical diatomite experience, he can help you with your filtration problems. Call him today or write Johns-Manville, Box 14, New York 16, New York. In Canada, write 565 Lakeshore Road East, Port Credit, Ontario.

\*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.



**Johns-Manville CELITE FILTER AIDS**

To U.S. industries, these refugees from Soviet communism bring know-how and skills in technology and the sciences.



Several hundred Hungarian refugees are already doing well in chemical process industry jobs.



## Refugee Scientists 'Fit in Nicely'

In the face of recent, scattered Congressional criticism of Administration plans to liberalize immigration laws, U.S. industrialists and educators report that relocated Hungarian scholars and professionals are "fitting in nicely," will likely make significant contributions to U.S. industrial life.

Already, approximately 250 technical students are in various stages of preparation for entrance into college training, and some 450 professionals—mostly in the sciences—have been processed for industrial and academic jobs.

A complete list of Hungarian refugee professionals already established in chemical process industries would be a lengthy one, but a few note-

worthy examples include hydride chemist Janos Kollonitsch (*at left in left-hand photo*), recently hired by Metal Hydrides (Beverly, Mass.); Tibor Kopjas (*second from right in lower right-hand photo*), now in his second month at California Spray-Chemical Co. (Richmond, Calif.); and a 36-year-old Budapest chemical engineer—whose family is still in Hungary—now with Chas. Pfizer Co. In addition, Allied Chemical & Dye reports having already hired four chemists, with several more prospects under consideration.

**Lining Up Jobs:** In the thick of the search for jobs for Hungarian refugee professionals is the National Academy of Sciences.

To date, through its emergency operations at Camp Kilmer, N.J.—headquarters for the Hungarian refugee program (*CW Business Newsletter*, Jan. 5), NAS has processed approximately 400 people for industrial and academic jobs, in cooperation with sponsoring agencies. Despite this substantial number—about 20% represent chemists and chemical engineers—NAS reports that the demand for personnel greatly exceeds the supply.

A recently established NAS project at Rutgers University (New Brunswick, N.J.) is a language and orientation program for Hungarian scholars, which gives refugees eight weeks of English language training and orienta-

# CSC NITROPARAFFINS



**NITROMETHANE**  
 $\text{CH}_3\text{NO}_2$



**NITROETHANE**  
 $\text{CH}_3\text{CH}_2\text{NO}_2$



**1-NITROPROPANE**  
 $\text{CH}_3\text{CH}_2\text{CH}_2\text{NO}_2$



## IMPROVING PROCESSES AND PRODUCTS



**2-NITROPROPANE**  
 $\text{CH}_3\text{CHNO}_2\text{CH}_3$



**2-AMINO-2-METHYL-1-PROPANOL**  
 $\text{CH}_3\text{C}(\text{CH}_3)\text{NH}_2\text{CH}_2\text{OH}$



**TRIS (HYDROXYMETHYL) AMINOMETHANE**  
 $(\text{CH}_2\text{OH})_3\text{CNH}_2$



## FOR AMERICA'S MAJOR INDUSTRIES



**2-AMINO-2-METHYL-1,3-PROPANEDIOL**  
 $\text{CH}_2\text{OHC}(\text{CH}_3)\text{NH}_2\text{CH}_2\text{OH}$



**HYDROXYLAMMONIUM ACID SULFATE**  
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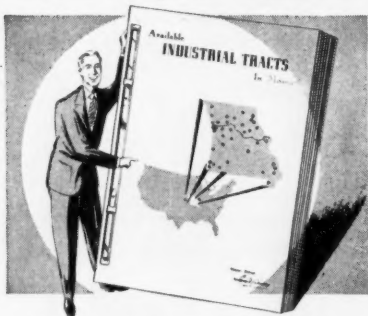
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## ADMINISTRATION

tion to fit them for job placement.

The project, which is currently providing about 40 especially qualified Hungarians with five hours of language instruction a day, along with informal talks on U.S. history, culture and education, serves an additional purpose. It allows more time to match each refugee with the job for which he is best qualified.

**Placing the Students:** Handling the hundreds of Hungarian students seeking to resume their education in the U.S. is quite a job, requiring the full attention of a number of agencies, among them the World University Service, Institute of International Education, International Rescue Committee, U.S. National Student Assn., and the National Catholic Welfare Conference.

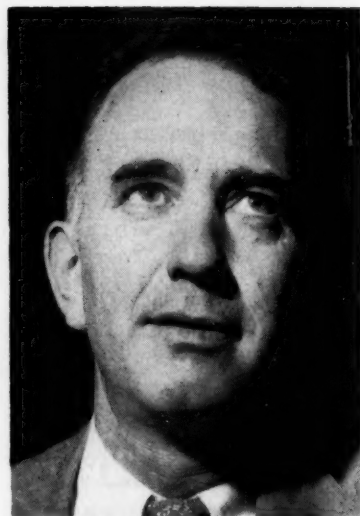
So far, these agencies, with the help of educational institutions all over the country, have succeeded in making available 500 scholarships at 230 colleges. And these figures increase almost daily. The one drawback appears to be the disproportionate number of liberal arts scholarships available. About 75% of all refugee students majored in the sciences in Hungary.

The significance to U.S. industry lies both in the obvious addition to the country's current and future scientific manpower pool, and in the equal drain on the corresponding Communist pool. Wallace Atwood, Jr., codirector with M. H. Trytten of the NAS Kilmer project, sums up the situation like this:

"There is no question that these professionally trained individuals will constitute a real asset to our scientific community."

## LABOR

**Hiring Rise Seen:** An increase in employment at chemical plants next month is predicted in a Labor Dept. survey based on a poll of management officials in 149 of the nation's principal industrial communities. Director Robert Goodwin of the department's Bureau of Employment Security says the outlook is for stepped-up hiring in nearly three-fourths of those areas, with chemicals, machinery, aircraft, apparel and construction as fields expected to be most active in the labor market. Goodwin adds, however, that in most cases the manpower buildup will be small and in many cases only seasonal in nature.



**GOODWIN:** For next month, he sees an upswing in plant employment.

Goodwin's forecast comes on the heels of a report by another Labor Dept. unit—the Bureau of Labor Statistics—showing that employment in chemicals and allied products rose slightly in December to a total of 839,000. This was 13,600 more than at the close of 1955, and 45,300 more than the year-end figure for '54. Number of production and maintenance workers at year-end '56 had declined to 551,800 from 555,900 in '55, while average hourly earnings rose from \$2.03 to \$2.14.

**Sunday Work Suit:** In South Carolina, four employees at the Celriver plant of Celanese Corp. are bringing suit under a state law that limits and regulates Sunday work at industrial plants. The four plaintiffs—who say they are conscientiously opposed to working on Sunday—are requesting the Court of Common Pleas at York to order Celanese:

- To refrain from assigning employees to Sunday work shifts.
- To pay plant employees premium wage rates for all Sunday work performed during the past six years.

Plant Manager J. P. Loud says Celanese believes it's operating within the law, and that the company understands that the law in question does not apply to continuous-process chemical plants.

**Charged with Corruption:** While governmental and AFL-CIO units con-



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Want to investigate this aldol product...or others† we plan to produce? Drop us a line or ask your Celanese representative to give you the facts.

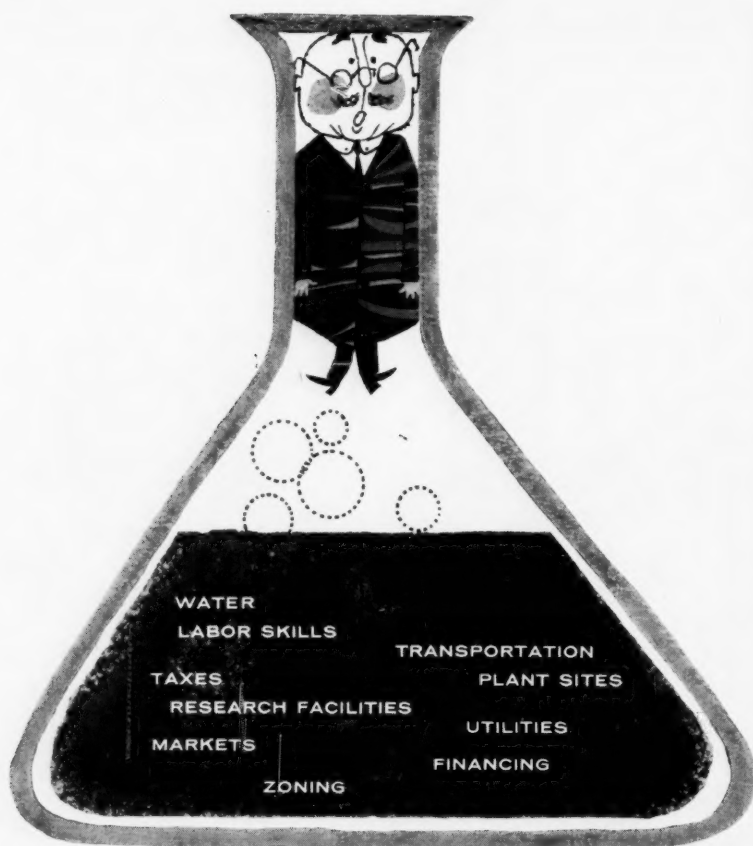
Celanese Corporation of America, Chemical Division, Dept. 652-B, 180 Madison Ave., N. Y. 16.

†1,3-Butylene Glycol, for instance . . . or Methyl Isopropenyl Ketone.

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## ADMINISTRATION

continue their drives against labor racketeers, the executive board of the International Chemical Workers Union (AFL-CIO) is preparing to hear corruption charges against officers of the New York City local that was placed under supervision last week (*CW Business Newsletter*, Feb. 9). ICWU President Walter Mitchell and Secretary-Treasurer Marshall Shafer instructed organizer John Banks to administer the affairs of Local 587 pending the union trial. However, Arthur Santa Maria—one of the local officials accused of having underworld connections—reportedly told Banks that the local's membership had already voted to drop out of ICWU and to affiliate instead with the International Brotherhood of Teamsters (AFL-CIO).

## KEY CHANGES

**Charles W. Mitchell**, to vice-president and general manager, Nyotex Chemicals Division, Stauffer Chemical Co.

**Monroe C. Gutman**, to director, Commercial Solvents Corp.

**Philip K. Reilly, Jr.**, to assistant to the president, and **J. B. Cochran**, to development administrator, Atlantic Research Corp. (Alexandria, Va.).

**Walter F. Strobel**, to vice-president in charge of production, Pecora Paint Co. (Philadelphia).

**Charles F. Johnson, Jr.**, to board chairman, and **Frank A. Johnson**, to president, Endicott Johnson Corp. (Endicott, N.Y.).

**Russell Brittingham**, to president, Pittsburgh Corning Corp.

**William A. Harshaw II**, to vice-president, research, and **Leslie N. Smith**, to vice-president, scientific division, Harshaw Chemical Co. (Cleveland).

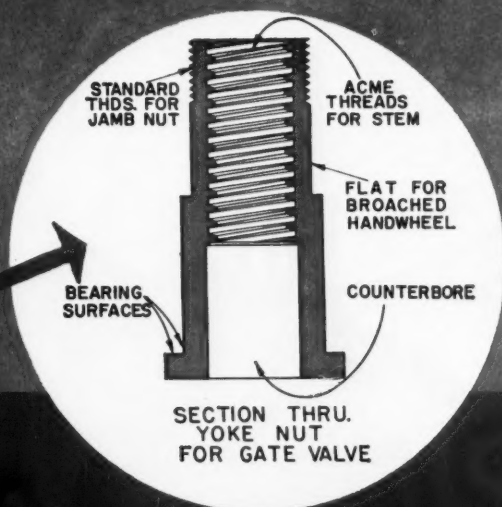
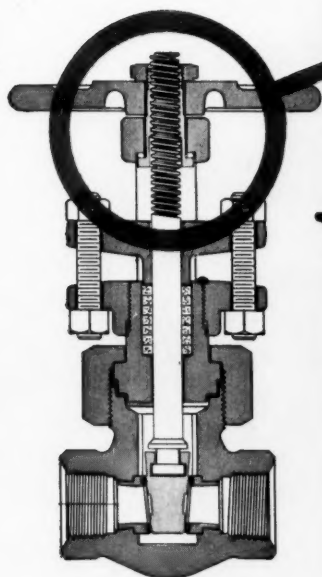
**Henri S. Seltzer**, to president, Bengué, Inc. (Union City, N.J.).

**Lee L. Davenport**, to president, Sylvania-Corning Nuclear Corp. (New York).

**E. J. Lukas**, to export dept. manager, Organic Chemicals Division, American Cyanamid Co.

**Franklin T. Peters**, to asst. manager, Fine Chemicals Division, Shulton, Inc. (Clifton, N.J.).

**Robert C. Sutter**, to operations manager, Chlorinated Products Division, Diamond Alkali Co.



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## yoke nuts

Heat and wear-resisting *stainless steel* yoke nuts in Vogt Valves give longer trouble-free service. We have proved this in our own "Torture Chamber," under constant and accelerated testing, as well as in tough service applications. They are made from a special stainless steel alloy having excellent bearing quality, matchless strength, and a melting point of approximately 2700°F.

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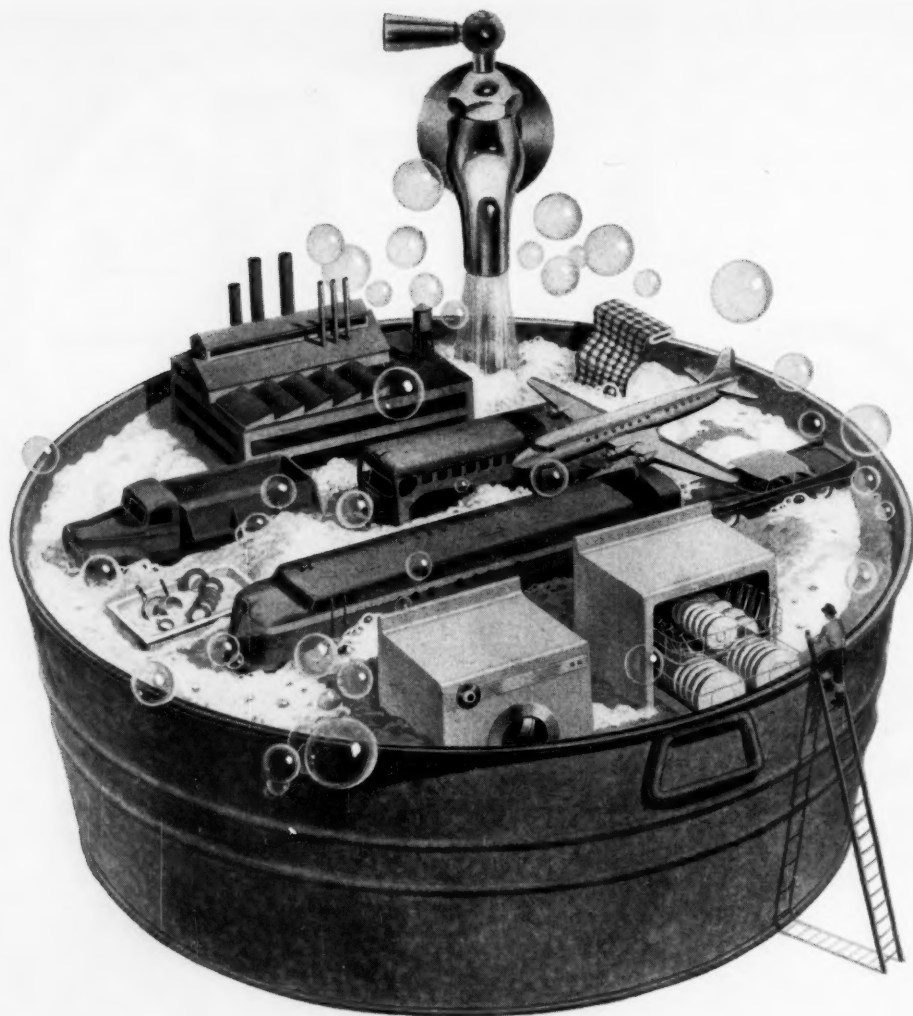
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plication of large-scale continuous processing methods. This program has led to an imposing list of patents and has established Oronite ALKANE as the one standard of quality, the unduplicated raw material of the detergent industry.

Marketing the leading detergent raw material also brings a responsibility to the future. As in the past, millions of dollars are being invested in research and manufacturing facilities to assure that "you can expect from Oronite, whatever is new or better in detergent raw materials."

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\*Trademark for detergent intermediate



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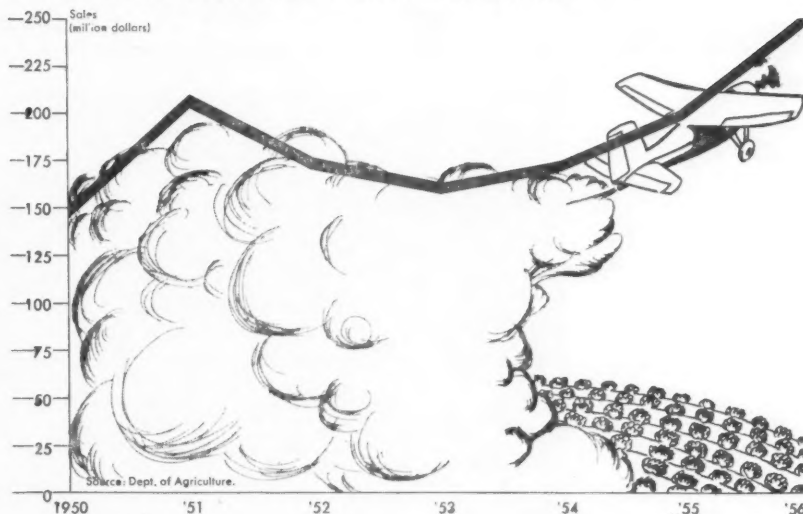
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# Charting Business

CHEMICAL WEEK  
February 16, 1957

## PESTICIDE SALES REACH NEW PEAK IN '56

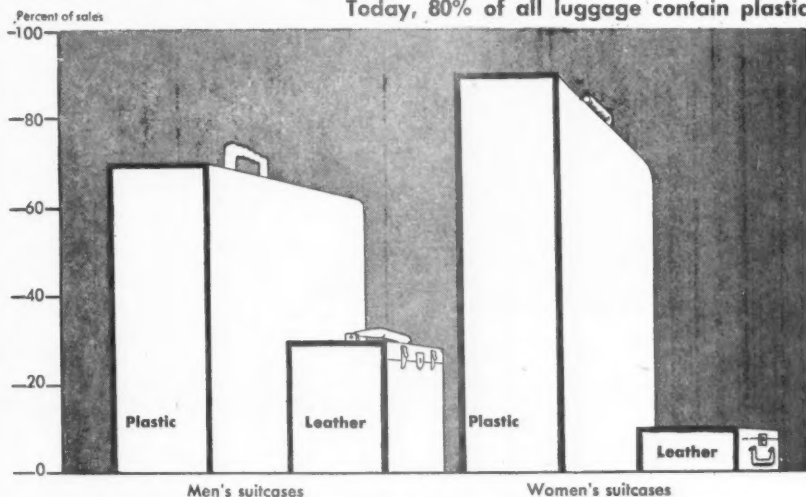


**P**RODUCERS' sales of pesticide chemicals hit a new high of \$250 million last year—a 25% gain over '55. Reasons: increased use of pesticides both on the farm and in the home, stepped up public health insect control programs, growing campaigns against landscape diseases and

pests along highways. One drawback: producers' stock carry-over in '56 was higher than in '55. Stocks of chlorinated hydrocarbon pesticides, for example, were 90% higher than in '55, DDT showed a 78% pile-up, and benzene hexachloride, 100%.

## PLASTICS SUCCEED IN THE LUGGAGE INDUSTRY —

Today, 80% of all luggage contain plastic



**W**ITH a growing preference for lightweight, inexpensive luggage, the use of vinyl and other plastics in luggage has been increasing at a steady clip. Today, at least 80% of all luggage made will be covered with some form of vinyl,

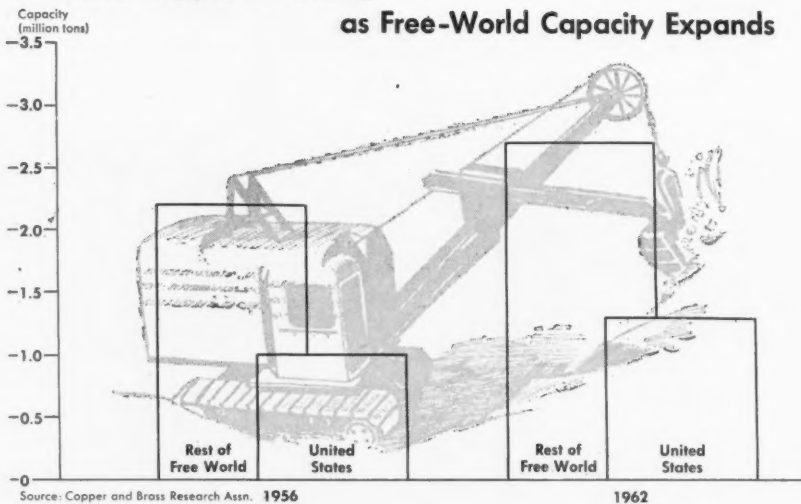
either fiber sheet or coated fabric. By comparison, in 1947, only some 45% of luggage sold contained plastic. Plastic used then was admittedly inferior to the technically improved vinyl used today. Luggage sales in '57: likely \$200 million.

## Charting Business

(Continued)

### Still More Copper Is Coming

as Free-World Capacity Expands

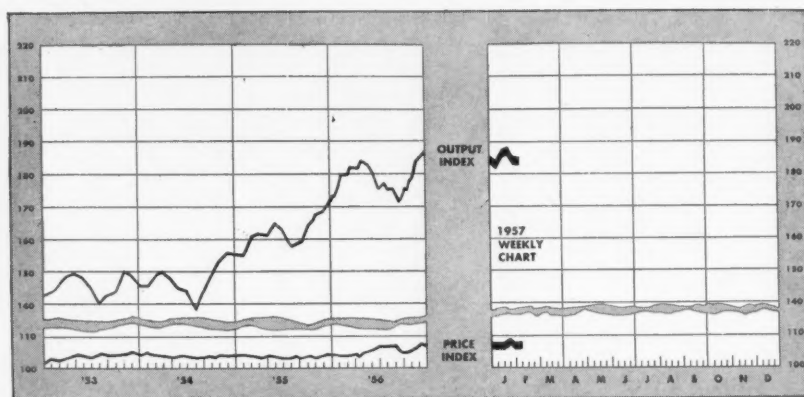


“WILL there be enough copper to meet demands?” Answering this question for various industries affected by past copper shortages, copper industry spokesmen predict adequate future supplies of this metal. Reason: as a result of plant expansions and development of ore bodies, world capacity should hit close to

4 million tons by 1962. Too, potential ore sites in Canada, Africa and South America could add well over 100,000 tons/year to present capacity predictions.

Last year, U.S. mine output, which accounts for one-third of the free-world supply, was over 1 million tons, a 12% increase over '55.

### Business Indicators



#### WEEKLY

Chemical Week Output Index (1947-49=100) .....  
Chemical Week Wholesale Price Index (1947=100) .....  
Stock Price Index of 11 Chemical Companies  
(Standard & Poor's Corp.) .....

Latest Week	Preceding Week	Year Ago
183.7	184.1	180.0
108.3	108.4	105.3
408.0	413.1	458.7

#### MONTHLY

Employment (thousands)

All Manufacturing .....  
Nondurable Goods .....  
Chemicals and Allied Products .....

Latest Month	Preceding Week	Year Ago
13,329	13,368	13,451
5,522	5,555	5,613
551.8	552.8	555.9

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# RIPPLE TRAY\*

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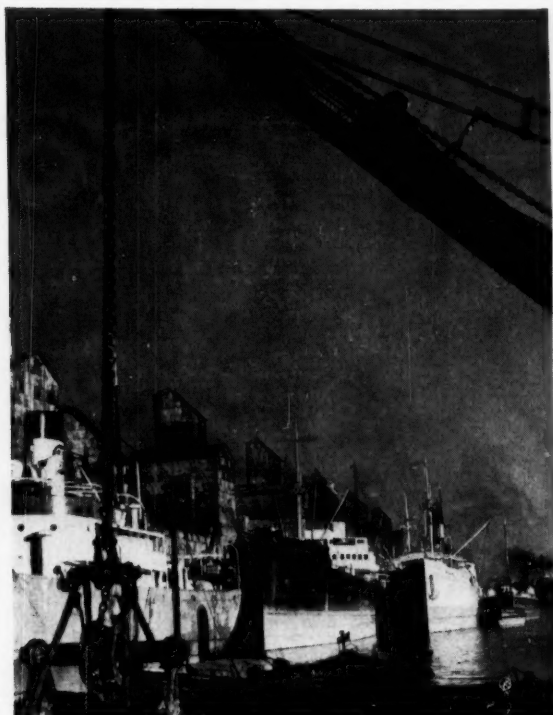
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**SHIPS TO SOUTH AMERICA:** More chemical cargo carried 'made in U.S.A.' stencils last year than in '55.

## Latin Export Race: U. S. Sets the Pace

The United States has lengthened its lead over European competition in the race for the \$600-million\* chemical market in Central and South America. That will be apparent in the soon-to-be-published, first-half-'56 Commodity Trade Statistics of the United Nations.

Paced by big boosts in organic, inorganic and fertilizer chemicals, the U.S. rang up total sales of \$179.2 million in the first six months of '56, a gain of \$15 million over '55.

And it upped its share of the market to 60.2% for first-half '56, from a 57.3% slice for all of '55. On an extrapolated basis, the U.S. may have exported about \$358 million worth of chemicals to its southern neighbors last year.

Here's how the international tussle for Latin chemical markets shapes up (see boxes, pp. 48, 50):

\*This figure includes only exports assigned to a specific country. Unassigned chemical exports to Latin America are believed to be in the neighborhood of \$30 million for 1955. All figures given include shipments to European territories in the Caribbean area, exclude exports from the U.S.S.R. and all satellites except Yugoslavia.

**Inorganic Chemicals:** Compared with all of '55, the U.S. and the U.K. increased their market shares in the first six months of '56 about 3 percentiles. Germany held constant, while France, the big loser, plummeted from 6.1% to 2.7%. Total '56 sales should exceed '55's by \$5 million.

**Organic Chemicals:** Extrapolation of Jan.-June '56 figures points to a \$44.8-million volume for the year for the U.S., or 61.1% of the total market. Last year's exports: \$42.1 million, 59.7% of the market. West Germany also stepped ahead from 19.5% to 21%. All other nations—France, particularly—fell behind '55 figures.

**Chemical Materials—NES:** Plastics, starches, gums, insecticides and almost everything that can't be classed in other groups comprise this category. Most significant is the downtrend in total sales; projection of first-half-'56 data gives a year's total of \$132.4 million vs. \$144.5 million in '55. In this contracting market, however, the U.S. boosted

its share from 52.8% to 56.4%. Of the others, only West Germany was able to carve a larger chunk (up to 13.1% from a previous 10%).

**Paints:** "Declining sales" best describes the over-all picture. On an annual rate basis, '56 sales will total \$31.2 million—a 14.7% drop from '55. For the U.S., West Germany, Canada, the Netherlands and the U.K., there's a bit of consolation: all increased their share of the total market—chiefly at the expense of smaller European countries.

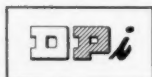
**Soap and Cosmetics:** Beset by surging competition from the U.K. and France, the U.S. lost ground during the first half of '56 in the soap and cosmetics category. Our percent-of-market slipped to 55.9 from the all-'55 value of 58.6. France, however, moved up 3 percentiles, the U.K. 2. Total '56 exports to South America will approximate '55's sales of \$26.3 million.

**Fertilizers:** Despite a disappointing year in domestic sales, fertilizer producers can cheer returns from Latin



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Eastman make it  
for you . . .**

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## SALES

America. Annual rate 1956 sales are 31% ahead of '55's. And the U.S. has boosted its cut of the melon to 61.5%, from last year's 51.1%. West Germany was the only other country that increased business. The U.K. took the worst beating, stumbled from 5.9 to 0.9% of the market.

**Coal-Tar Dyes:** Market dominance

may be shifting from Switzerland to West Germany. While Switzerland maintained its impressive 31%-plus of the market in the first six months of '56, West Germany recorded a gain, from 21.9% in '55 to 30.8% in the Jan.-June '56 period. The U.S. share diminished a trifle, and France and Italy suffered serious reverses.

## Chemical Exports to Latin America

	Sales (million dollars)		Market Share (percent)	
	1955	1st half '56	1955	1st half '56
<b>Inorganic Chemicals</b>				
U. S.	\$37.5	\$21.4	50.4	53.7
U. K.	13.5	8.3	18.2	20.9
W. Germany	7.6	4.1	10.2	10.2
France	4.5	1.1	6.1	2.7
Yugoslavia	2.3	0.8	3.1	2.0
Italy	2.0	1.1	2.6	2.7
<b>All Exports</b>	<b>74.4</b>	<b>39.8</b>		
<b>Organic Chemicals</b>				
U. S.	\$42.1	\$22.4	59.7	61.0
U. K.	4.0	1.8	5.7	4.8
W. Germany	13.7	7.7	19.5	21.0
France	3.3	0.5	4.7	1.4
Italy	2.8	0.9	4.0	2.4
<b>All Exports</b>	<b>70.5</b>	<b>36.7</b>		
<b>Chemical Materials Not Elsewhere Specified</b>				
U. S.	\$76.3	\$37.3	52.8	56.4
U. K.	22.2	8.8	15.4	13.3
Canada	16.0	5.0	11.1	7.5
W. Germany	14.4	8.6	10.0	13.1
France	4.9	1.0	3.4	1.6
Netherlands	3.0	1.9	2.1	2.8
<b>All Exports</b>	<b>144.5</b>	<b>66.2</b>		
<b>Paints</b>				
U. S.	\$26.5	\$11.3	72.4	72.6
U. K.	4.4	2.1	12.0	13.5
W. Germany	2.0	1.0	5.4	6.2
Netherlands	0.9	0.5	2.4	3.3
Canada	0.5	0.3	1.5	2.2
<b>All Exports</b>	<b>36.6</b>	<b>15.6</b>		



# If it's made with water,

**"Dutch Boy" gellant research  
may help you improve it**

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Other products of "Dutch Boy" gellant research improve it ... "Dutch Boy" BENTONE® 18-C for high polarity systems such as epoxy resin lacquers; "Dutch Boy" BENTONE 34 and 38 for lower polarity systems: greases, paints, mastic compounds, for example.

"Dutch Boy" chemical research has come up with seventeen stabilizers for vinyls, too. They improve the life of flooring, insulation, upholstery, many other products.

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## SALES

Total export coal-tar dye sales continued to slide; extrapolation of six-month results gives a likely \$23-million total. The 1955 exports: \$24.6 million.

**Drugs and Pharmaceuticals:** Drug shipments, after skidding from a total \$158 million in '54 to \$142.7 million in '55, appear on the rebound. They

should hit \$147 million for all of '56. Both West Germany and the U.S. obtained larger market shares between Jan. and June '56 than for all of '55. Switzerland, second-most-important market factor, dropped 1.4 percentiles (to 10.4%), and the United Kingdom's share remained at 5%.

## Chemical Exports to Latin America

(Continued)

	Sales		Market Share	
	(million dollars)		(percent)	
	1955	1st half '56	1955	1st half '56
<b>Soap and Cosmetics</b>				
U. S.	\$15.4	\$7.1	58.6	55.9
U. K.	5.9	3.1	22.3	24.2
France	2.0	1.4	7.8	10.7
W. Germany	1.0	0.4	3.9	3.3
Switzerland	1.6	0.6	6.2	5.0
<b>All Exports</b>	<b>26.3</b>	<b>12.8</b>		
<b>Fertilizers</b>				
U. S.	26.3	17.3	51.1	61.5
U. K.	3.0	0.3	5.9	0.9
Bel.-Lux.	6.0	0.4	11.7	9.6
W. Germany	8.8	5.7	17.2	20.4
France	3.8	1.5	7.3	5.5
<b>All Exports</b>	<b>51.4</b>	<b>28.1</b>		
<b>Coal-Tar Dyes</b>				
U. S.	4.9	2.2	19.7	19.1
U. K.	2.0	1.2	8.1	10.2
W. Germany	5.4	3.5	21.9	30.8
France	1.6	0.2	6.4	1.5
Italy	1.3	0.4	5.3	3.0
Switzerland	7.7	3.6	31.2	31.5
<b>All Exports</b>	<b>24.6</b>	<b>11.5</b>		
<b>Drugs and Pharmaceuticals</b>				
U. S.	96.5	51.8	67.6	70.3
U. K.	7.2	3.7	5.0	5.0
W. Germany	9.6	5.9	6.7	8.0
France	3.1	0.9	2.1	1.2
Italy	4.2	1.3	2.9	1.8
Switzerland	16.9	7.7	11.8	10.4
<b>All Exports</b>	<b>142.7</b>	<b>73.7</b>		

# 5086

**HIGHEST STRENGTH  
ALUMINUM FOR UNFIRED  
PRESSURE VESSEL FABRICATION**

Kaiser Aluminum now offers you alloy 5086... the highest strength aluminum alloy available for the fabrication of unfired pressure vessels.

Non-heat-treatable 5086 is designed specifically for welded structures requiring maximum joint strength and efficiency, plus light weight and corrosion resistance.

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For complete information, call the Kaiser Aluminum sales office listed in your phone directory. Process Industries Department, Kaiser Aluminum & Chemical Sales, Inc., General Sales Office, Palmolive Bldg., Chicago 11, Illinois; Executive Office, Kaiser Bldg., Oakland 12, California.

## PHYSICAL CHARACTERISTICS OF ALLOY 5086

### Typical mechanical properties in various tempers

	Temper			
	"O"	H32	H34	H112
Tensile strength (psi)	38,000	42,000	47,000	39,000
Yield strength (psi)	17,000	30,000	37,000	19,000
Elongation (% in 2")	22	12	10	14

### Allowable design stress values

Condition (temper)	For metal temperature not exceeding deg. F.	
	100°	150°
Annealed	8700 psi	8700 psi
H112	8700	8700
H32	10,000	9900
H34	11,000	10,800

### Allowable stress values for welded construction compared with other alloys

Alloy Designation		For metal temperature not exceeding 150° F. (annealed condition)
AA	ASTM	
1160	996A	1650 psi
1100	990A	2350
3003	M1A	3150
3004	MG11A	5650
5050	G1A	4000
5052	GR20A	6250
5154	GR40A	7350
5086	GM40A	8700

### Nominal composition

4.0% magnesium  
0.45% manganese  
0.10% chromium

### Typical weld strengths (specimens tested across the weld)

37,000 psi tensile strength  
18,000 psi yield strength  
13% elongation

Kaiser aluminum 5086 is available in flat and coiled sheet, plate and extrusions.

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## SALES

### In Search of Salesmen—

**New survey of National Sales Executives' membership reveals that in the industrial sales field**

- ✓ Member companies will require 18,000 salesmen and 14,000 sales trainees in the next six months.
- ✓ 42% will offer industrial salesmen salaries over \$450/month to start.
- ✓ 62% insist that industrial salesmen be college graduates.
- ✓ 11% will hire men over 45 years of age for industrial sales positions.
- ✓ 47% will not accept sales trainees over 32 years of age.

### Spotlight on Manpower

A just-completed survey by National Sales Executives, Inc., spotlights at least one big reason for the current shortage of salesmen. Many companies, reports the group, have a strong reluctance to hiring older salesmen; only 16.5% of industrial\* marketers and only 23.3% of sales executives managing "business routes"\* will hire salesmen over 40 years old.

**Why Not Older Salesmen?** "Company policy" was given as the reason in 40.7% and "pay scale" in 10.5% of the returns. Curiously, the study refutes the belief that company-paid retirement plans form an age barrier; only 4.9% of the respondents have such plans.

Practice in hiring sales trainees also points up the question of age. In the industrial classification, 13.6% set 24-26 years as the maximum age for sales trainees, while 10.6% set 27-29 as the top bracket. Only 5.9% would hire trainees as old as 39-41. "Business route" respondents voiced similar requirements: 35.4% will hire trainees in the 30-32-year-old bracket, 25.2% said that 33-35 was the age limit acceptable for fledglings.

**Salary Scale:** Compensation data

\*NSE classifies its membership in six categories. The business route group covers salesmen selling materials and supplies to business customers; the industrial category includes chiefly the technical salesman selling equipment, product supplies or services.

sheds little light on the cause of the current paucity of salesmen. More than 40% of "business route" salesmen are offered starting salaries exceeding \$400/month. And about 28% of all industrial staffers begin at \$500/month or more.

Average monthly earnings in the top third of sales forces indicate that lack of opportunity isn't behind the manpower scarcity. The top 11% of all industrial salesmen take home paychecks larger than \$900/month. But only about 6.4% of business route canvassers reach that income level.

Industrial salesmen for 22% of the companies covered in the survey are paid a straight salary; 12.1% receive straight commissions, and 65.8% are paid a combination salary and incentive plan bonus.

Fringe benefits, perhaps, may be a minor contributing factor to the criticalness in the supply of manpower. While 75.7% of companies employing industrial salesmen furnished life and accident insurance, only 5.6% had sales staff retirement plans and only 3% listed other fringe benefits. About 49% of firms tagged "industrial" provided cars for the salesmen. Many others, however, paid mileage allowances.

NSE makes no specific recommendations for solving the salesmen

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ALCOHOLS & SOLVENTS: Lower Alcohols, Oxo Alcohols, Ketones and Solvents; OIL & FUEL IMPROVERS: Detergent-Inhibitors, V-I Improvers, Oxidation Inhibitors; CHEMICAL RAW MATERIALS: Olefins, Diolefins, Aromatics; ENJAY BUTYL RUBBER & VISTANEX.



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February 16, 1957 • Chemical Week



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## SALES

shortage, but its reports does urge that "management re-examine company policy in regard to hiring experienced older salesmen." Logical assumption: such an evaluation could be a step toward alleviating the currently critical need facing chemical companies and other firms in the upcoming "hard sell" periods.

## DATA DIGEST

- **Epoxy plasticizers:** 4-p. bulletin describes the preparation and properties of epoxidized fatty-acid ester plasticizers, suggests uses in vinyl resins. Becco Chemical Division, Food Machinery and Chemical Corp. (Buffalo).

- **Colloidal dispersions:** Folder lists "dag" dispersions of graphite, vermiculite, zinc oxide, molybdenum disulfide and mica, tabulates physical properties and typical properties. Acheson Colloids Co. (Port Huron, Mich.).

- **Corrugated boxes:** 28-p. booklet discusses factors governing use of corrugated boxes in merchandising. Included: color, dealer needs, protection and promotion while in transit. Hinde & Dauch (Sandusky, O.).

- **Methylene chloride:** 24-p. brochure offers technical data, suggests uses in nonflammable paint removers, aerosol pressure depression, vapor degreasing, cold cleaning, adhesives carrier, and bonding plastic materials. Dow Chemical Co. (Midland).

- **Quaternary ammonium salts:** 15-p. bulletin presents chemical and physical characteristics for Arquads, a group of quaternary salts, suggests uses in wetting, sanitizing and emulsifying materials. Armour and Co. (Chicago).

- **Molybdenum disulfide:** Folder presents data on physical, thermodynamic, electrical, magnetic and chemical properties, describes applications in lubrication and catalysis. Climax Molybdenum Co. (New York).

- **Silicones:** 12-p. catalog lists silicone products by field of application, supplies technical data and describes specific uses. Dow Corning Corp. (Midland).

- **Cast vinyl film:** 20-p. illustrated brochure gives technical data on tensile strength, elongation, film clarity, chemical resistance, tear strength, and a summation of properties in 12 film formulations. Bakelite Co. (New York).

# **Eastman** **PLASTICIZERS**

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di-isobutyl adipate  
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di-isooctyl phthalate (DIOP)  
dioctyl phthalate (DOP)

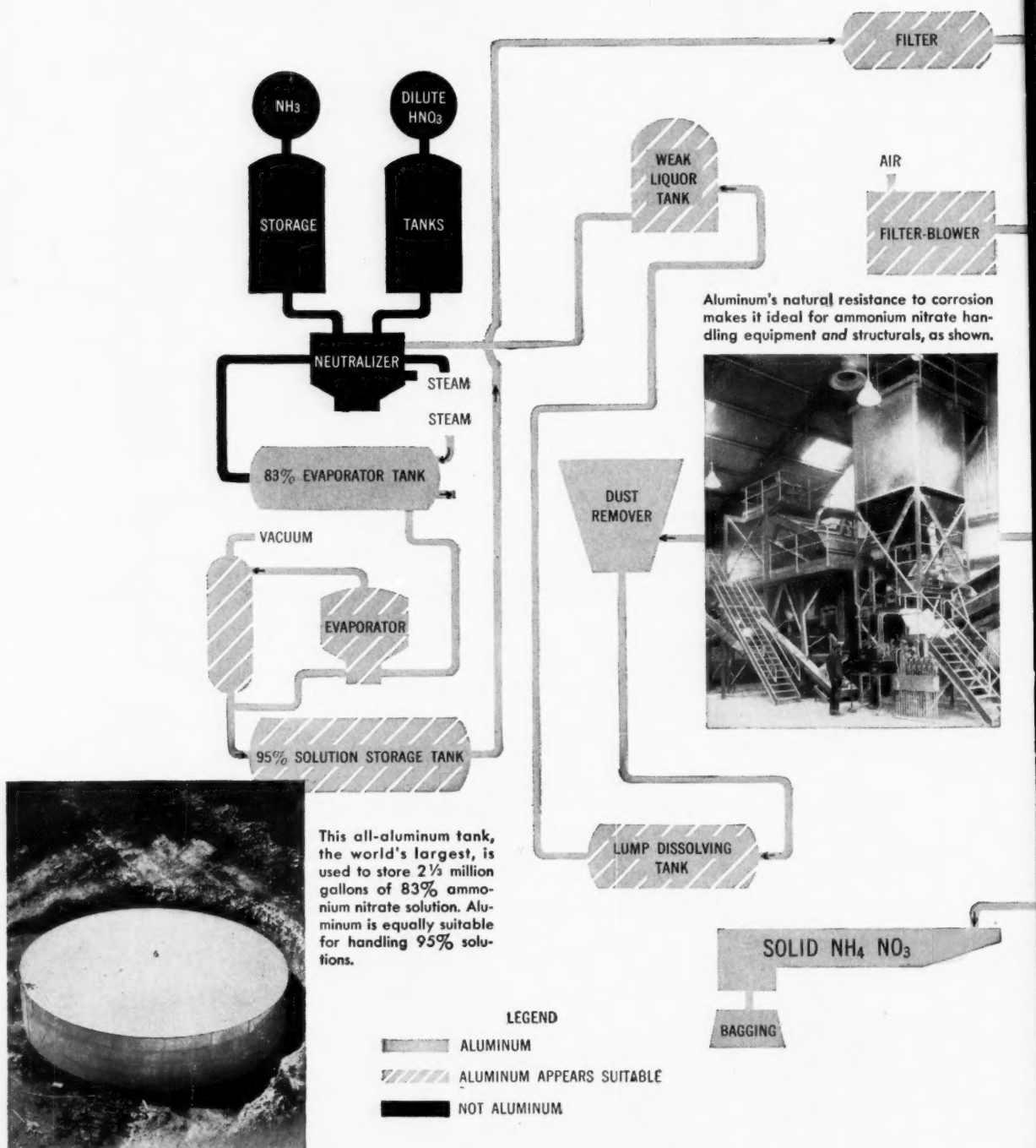
dioctyl adipate (DOA)  
dioctyl azelate (DOZ)  
dioctyl sebacate  
dinonyl phthalate  
plasticizer 84  
    —an octyl butyl phthalate  
polymeric plasticizer NP-10  
triacetin  
tributylin

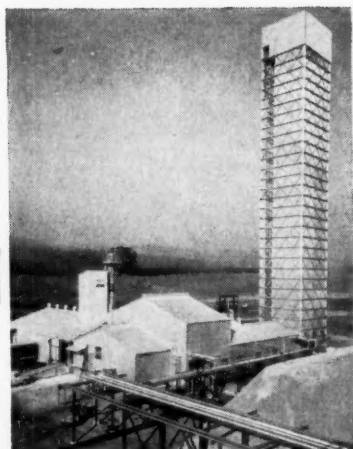
For highest quality finished products, rely on Eastman plasticizers — made under the most exacting and rigid specifications in the industry. Samples and technical assistance furnished upon request. Also write for our booklet describing Eastman plasticizers and their uses.

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This all-aluminum ammonium nitrate prilling tower is the tallest all-aluminum structure in the world—200 ft tall and 30 ft square. Frame, walls, piping, fittings, connections and fasteners all are aluminum to provide service uninterrupted by corrosion.

## Eliminate over 50% of your corrosion trouble spots:

**Specify Process Equipment**

**of Alcoa Aluminum!**

Here is a sound, low cost way to eliminate over 50% of the corrosion trouble spots in *your* process. The flow chart shows how it's done in a typical, highly corrosive operation. The answer: Specify process equipment of Alcoa® Aluminum.

Many liquids and gases normally corrosive to most metals will not corrode aluminum. It resists, successfully, attack by process materials *as well as* the corrosive atmospheres which often surround equipment. And aluminum also offers you this unique combination of highly desirable benefits: low cost . . . light weight . . . good workability . . . high thermal conductivity . . . excellent strength in alloys . . . non-magnetic, nonsparking characteristics . . .

nontoxicity . . . and excellent reflectivity.

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# SPECIALTIES



**THE PARTY:** Silly games and gifts draw women into abandoned buying spirit, make them feel obligated.



**THE PITCH:** Memorized soft sell and demonstrations for about 20 items are heart of Stanley party.

## Parties and Peddlers Bring Home the Sales

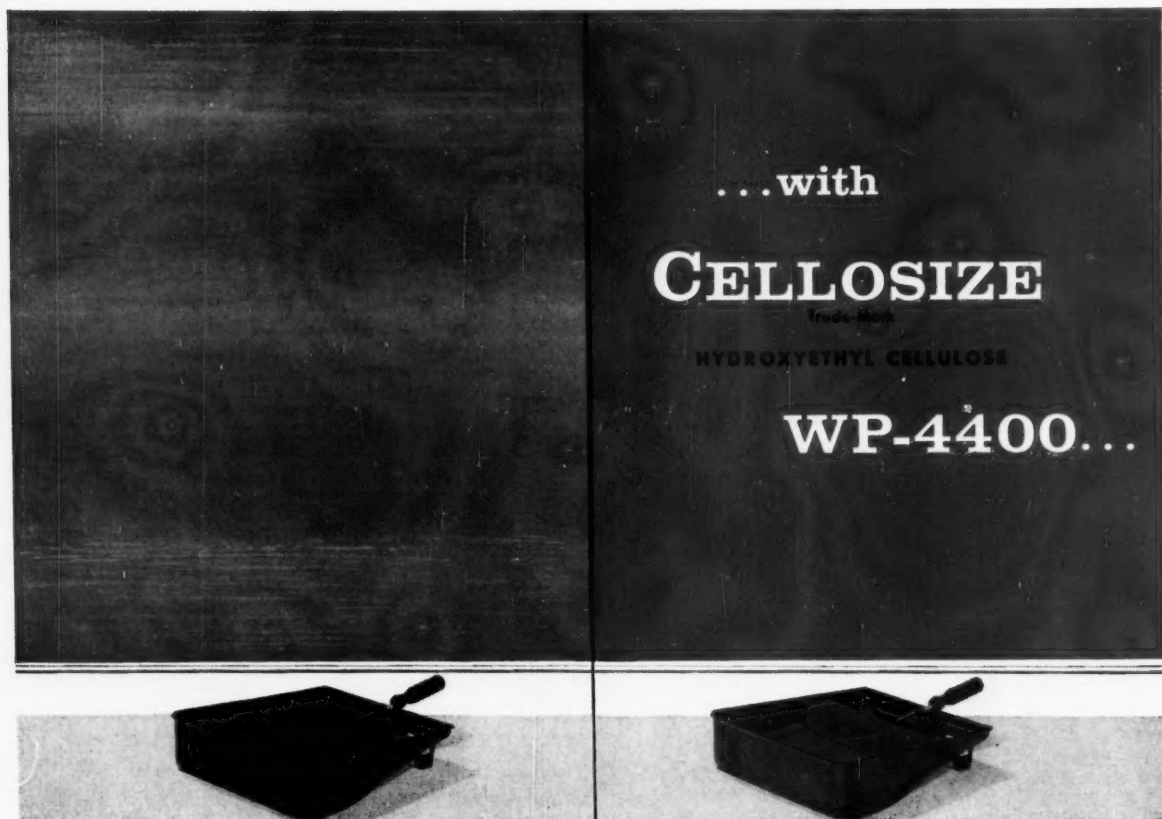
The ballroom of Washington's Sheraton-Park Hotel—in which many political gatherings have taken place—early this month was host to what looked like a small political convention. Under state-name signs sat 800 delegates to the annual convention of Stanley Home Products, Inc. (Westfield, Mass.). They cheered, sang, marched, demonstrated and listened to pep talks. As in a political campaign, Stanley's brush and chemical specialty salesmen listened to speeches designed to keep up their enthusiasm through November—the month that climaxes Stanley's sales season.

Emphasized, as in the past, were Stanley's so-called four business blessings: "We have a quality-plus line of merchandise to sell; people have the money to buy; our customers like this method of merchandis-



**THE GAGS:** Pitch includes items such as: 'Glue is the only Stanley product you'll get stuck with.'

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Nonionic CELLOSIZЕ WP-4400 gives clean, bright colors with minimum sheen variation.

## a new, nonionic, water soluble thickener

Your search for an excellent, nonionic, water soluble thickener for latex paints is over. The answer: CELLOSIZЕ Hydroxyethyl Cellulose WP-4400, a free-flowing, white powder. Its viscosity in 2% aqueous solution—3500-5000 cps. Look at the added advantages you get with this excellent thickener—

### In Production

- Goes into solution readily at room temperature—this saves you time and money
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- Reduces foaming in mixing kettle
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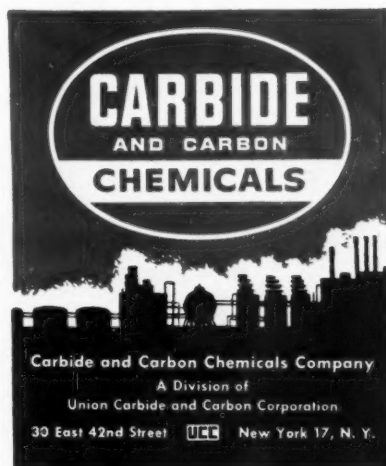
### In Application

- Contributes to better scrub resistance and washability
- Improves brushing, leveling, and flow-out
- Gives excellent color values, especially with popular deep decorator colors
- Reduces sheen variation
- Reduces pinholing
- Helps improve hiding power

Now is the time to get your samples and technical data. Write to Carbide and Carbon Chemicals Company, Room 328, Dept. H, 30 E. 42nd Street, New York 17, New York.

In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal and Toronto.

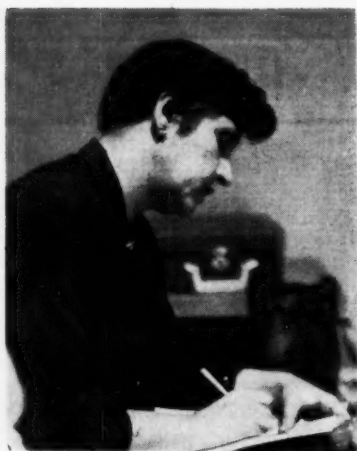
The term "Cellosize" is a registered trademark of UCC



## SPECIALTIES



**CATALOG** lets women select from full line, not just demonstrated items.



**ORDERS** are written by customers, who must return to pick up goods.

ing: we like this method of selling."

The method they like is the Stanley Home Party (*see cuts*), a highly profitable variation on the door-to-door-selling business. Direct selling, as the doorbell ringers call it, has been estimated to account for \$2 billion/year in sales—some 5½-6% of all retail sales. The portion of business is much larger for chemical specialties, which make up a major part of the stock-in-trade of the three biggest sellers, as well as that of many others of the 2,500 direct sellers in the U.S. House-to-housers, for example, sell 20% of the dollar volume in cosmetics.

**One to Choose From:** In the present day marketing system, the door-to-door route is about the only way house-

hold chemical products may be sold personally. That method has long-lasting appeal for many specialties makers. Probably chief among its attractions, it allows a firm to isolate its product from competitors. When a salesman calls at a home and shows a product, it is the only one in sight at the moment—as opposed to a drugstore or supermarket counter, where there may be a dozen products. All the salesman must do is to sell the idea of buying. When the idea has taken root, the theory is that he is right at hand to reap the benefits. Proof that this theory has merit can be seen in the records of some of the more successful direct sellers:

- Avon Products, Inc. (New York), with wholesale value of products it sells to its agents reaching somewhat over \$80 million in '56, uses the door-to-door approach in distributing all of its cosmetic line except its comparatively small private-label volume. This makes Avon the largest direct seller, and very possibly the largest cosmetic maker. Only Revlon's spectacular '56 sales increase (66%) to \$85.7 million might push Avon to the second spot.

- Stanley is the second-largest di-

rect seller. About two-thirds of its \$55-57-million maker-level sales are toiletries or household specialties such as polishes and cleaners.

- Fuller Brush Co. is in third place, selling about \$54 million—15% in cosmetics, the rest divided between vitamins, household specialties, and brushes.

A number of the other leading door-to-door dealers do a substantial business in specialties, too. High on the list: W. T. Rawleigh Co. and J. R. Watkins Co. (both based in Winona, Minn.) split about \$250 million/year in over-all retail business.

Third place in door-to-door sales of cosmetics alone (following Avon and Fuller) probably goes to Beauty Counselors, Inc. (Grosse Pointe, Mich.), with net sales of \$3.4 million for the first nine months of '56. Other big door-to-door sellers of specialties: Blair of Virginia (Lynchburg, Va.), The Grand Union Co. (East Paterson, N.J.), House of Stuart, Inc. (Newark, N.J.), Jewel Tea Co., Inc. (Melrose Park, Ill.), Sayman Products Co. (St. Louis, Mo.), and Studio Girl Hollywood (Glendale, Calif.).

**Who's Ahead?** Fuller has long been running a sort of hare-and-tortoise race



**PREMIUM**, which varies with sales total, goes to party hostess.

# We're on Stream!

## New Phthalic Anhydride Plant Doubles Pittsburgh Coke's Output of Essential Material



**P**ITTSBURGH COKE is now *producing and shipping* from its new multi-million dollar phthalic anhydride plant!

Under construction since last year, this efficient new production unit is engineered to keep pace with the chemical industry's steadily growing needs for basic supplies of high purity phthalic in both flake and molten form.

Now, more than ever before, you can count on Pittsburgh for the prompt deliveries and uniform phthalic quality that eliminate many of your production troubles.

Call in a Pittsburgh man today! He'll show you how to solve your P.A. supply problems *before* they happen—by going with Pittsburgh in '57!

### CALL

**NEW YORK**  
OXford 7-9050

**CLEVELAND**  
CHerry 1-2170

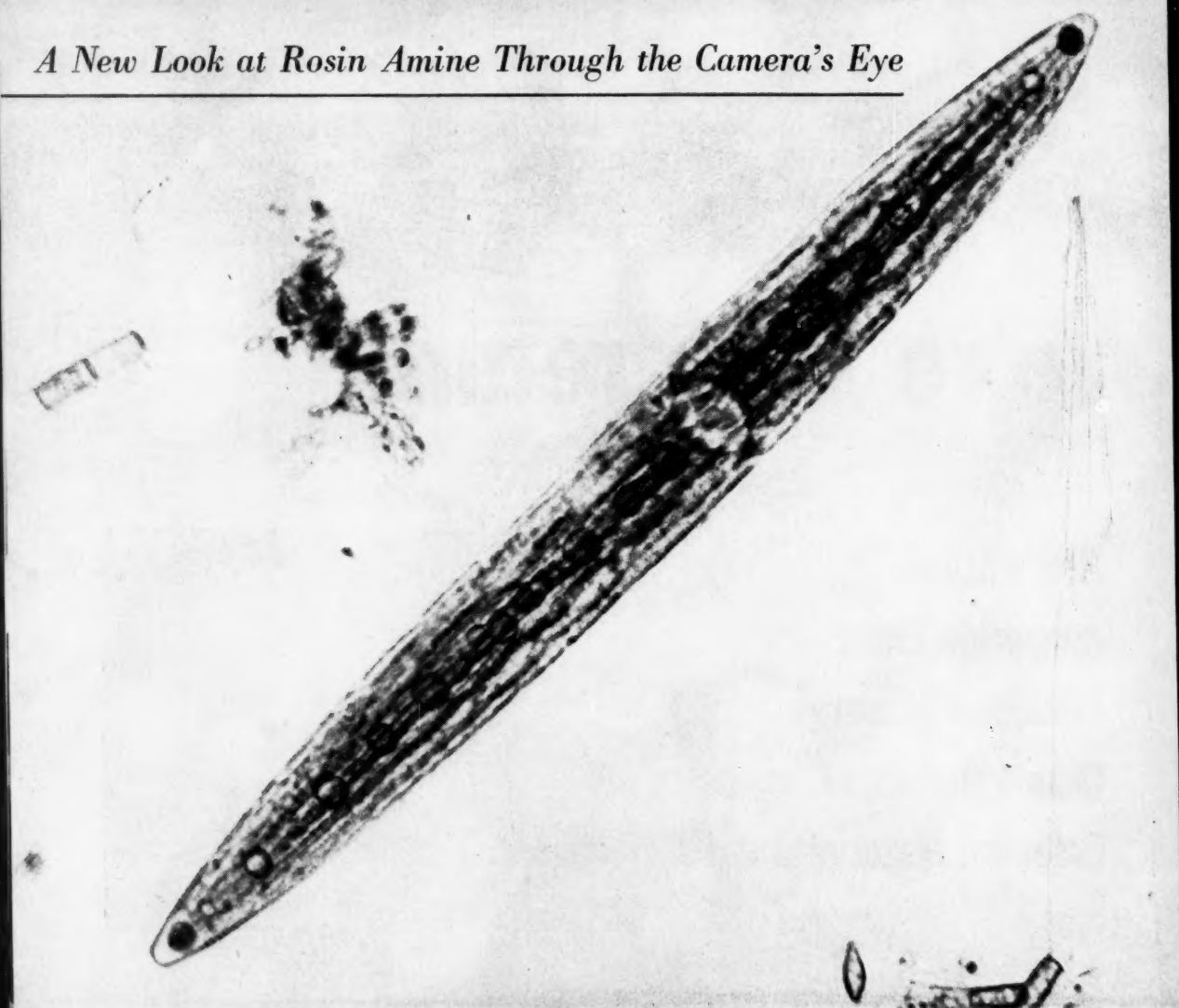
**PITTSBURGH**  
ATlantic 1-2290

**CHICAGO**  
CEntral 6-1760



COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

*A New Look at Rosin Amine Through the Camera's Eye*

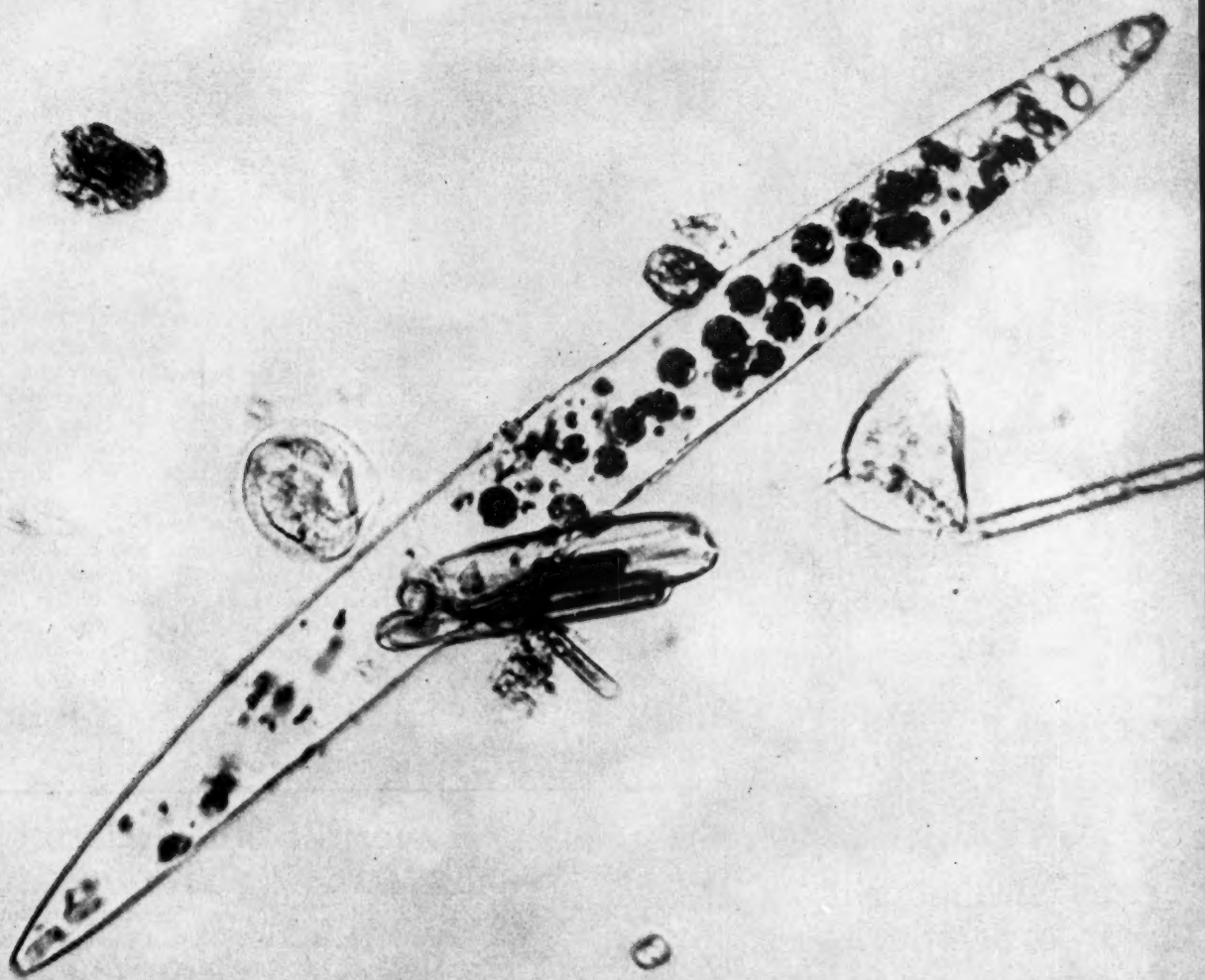


# Microbiological Control...

These microphotographs show the death of an alga. An individual alga—one of the many thousands of species of water-inhabiting organisms—is invisible to the naked eye. But hundreds of thousands of them clustered together can foul and plug equipment in cooling towers, paper mills, and other places where water is used in industry.

Hercules Rosin Amine D\* and its derivatives are biologically active and control the propagation of bacteria, algae, slimes and fungi. Hercules amine derivatives are included in the formulations of many water treating companies. If you have a water treatment problem, we will be glad to put you in contact with one of these companies.

\* Hercules trademark



**ABOUT THESE PHOTOGRAPHS**—These photographs show a live alga on the left with living protoplasm and food particle accumulations distributed throughout the cell. On the right, the same alga is shown after treatment with a rosin amine derivative. Color change and disintegration of the living protoplasm indicate its destruction. Photographs were taken

by Bernard Hoffman, one of the nation's leading science photographers. Magnification of these photographs is more than 1,000 diameters. A Magna Research Microscope and a Bausch and Lomb micro camera were used. A Zirconium light source with a diameter of 3/1000 of an inch was utilized.

## • • *EXAMPLE: Industrial Water Treatment*

Other applications utilizing this property of amine derivatives include the preservation of wood, paper, paint, glue and fabric and the control of bacteria responsible for corrosion in petroleum wells.

These amine derivatives come in oil-soluble and water-soluble types. We'll be glad to make detailed technical data available to you.



Pine Chemicals Division, Naval Stores Department  
**HERCULES POWDER COMPANY**

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MA57-1

**TC**  
TENNESSEE CORPORATION  
LIQUID  
SULFUR DIOXIDE  
HIGHEST  
QUALITY  
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## The Chemical of so many uses.

This versatile chemical is particularly recommended for its properties as a reducing, neutralizing and bleaching agent, preservative, antichlor and pH control.

Tennessee's Liquid Sulfur Dioxide is practically 100% pure.

In many fields of industry this chemical of hundreds of uses can be very efficiently and economically used in various production processes. Perhaps Tennessee's Liquid Sulfur Dioxide can be utilized to great advantage in your processing.

We would be pleased to discuss this versatile chemical with you.

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TENNESSEE CORPORATION  
**TENNESSEE CORPORATION**  
617-629 Grant Building, Atlanta, Ga.

## SPECIALTIES



with Stanley for its sales standing among direct sellers. Until 1949, Fuller was the top door-to-door firm, with sales of \$31.7 million in '48 against Stanley's \$29.5 million, Avon's \$21.25 million. In '49, Stanley zoomed ahead and kept climbing until it leveled off in '52 at about \$57 million. Its sales have been at this level ever since. Meanwhile, Fuller has pushed on with a steady 5-10% gain every year and

now seems to be catching up. While all this has been going on, Avon has rocketed past, beating Fuller in '53. Then in '55, it increased sales 25% more (to \$68.9 million), leaving even Stanley behind.

Fearful of being left behind altogether, Stanley has all hands busy trying to get its machine moving again. Among other things, the firm is wondering if the house-party plan hasn't reached its ceiling. It is seriously considering augmenting the parties with a regular door-to-door operation. (It sold this way from its beginning in '32 until '38, when it adopted the party plan then used primarily by aluminum-ware makers.)

It is rumored in the industry that Stanley might put out a cosmetics line. At present, it has some toiletries (toothpaste, cleansing cream, lotion, etc.), but doesn't believe cosmetics would fit the party plan—"discussing a woman's defects in a group wouldn't set well."

**Manhunt:** At present, however,

## \$64,000 Answer: 75,000 Sellers

What Revlon does in sales with its TV show, the \$64,000 Question, Avon Products, Inc., matches with 75,000 door-bell-pushing women. Both firms are now grappling for sales leadership of the cosmetics industry—Revlon through TV ads and retail store sales, Avon with its army of women. Here's how one of these women operates:

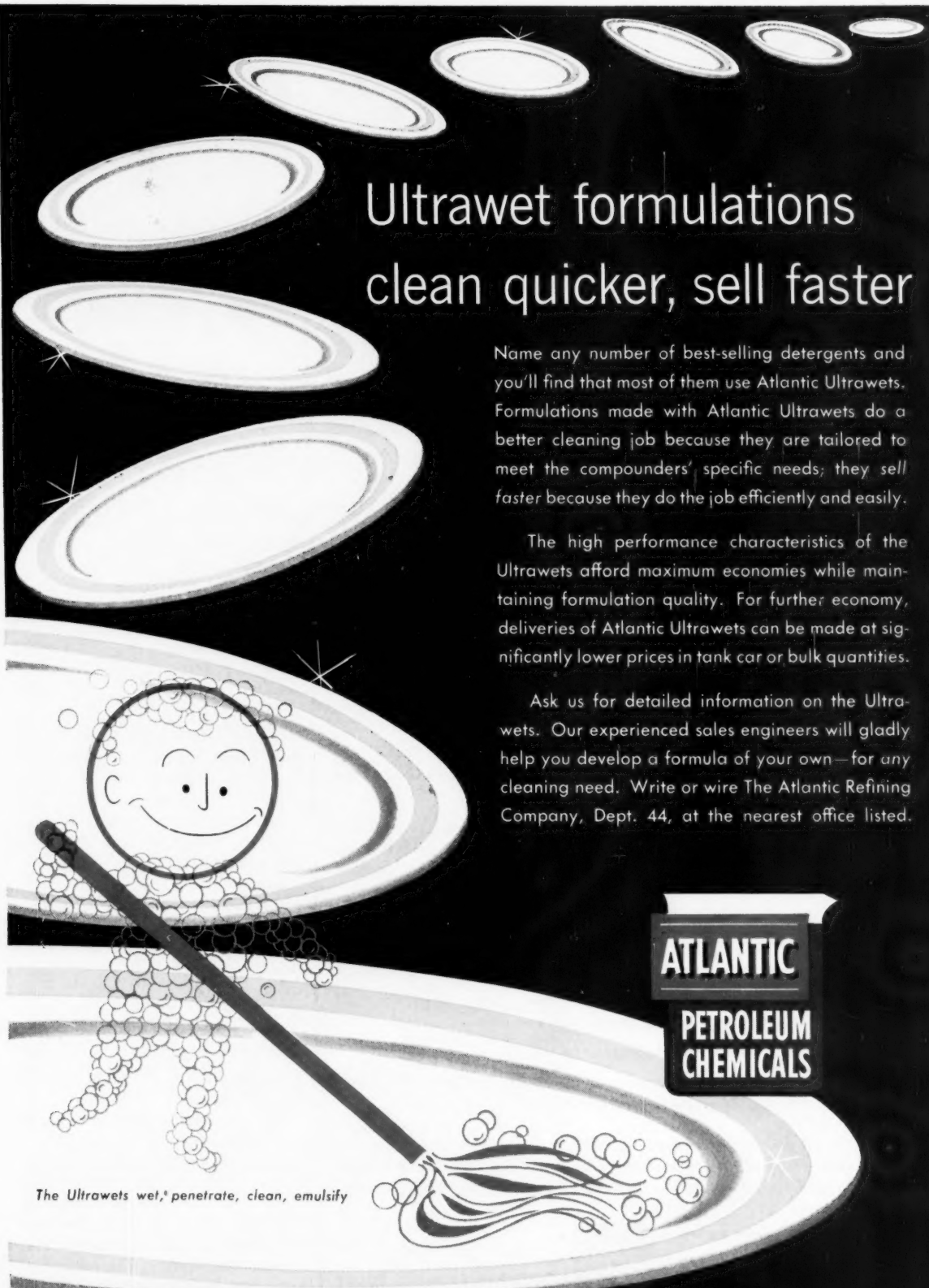
Mrs. Phyllis Miller is the top representative in Area 1 in Avon's Chicago district. She's been selling for Avon 5½ years, doesn't consider this a long time, says she knows others who have been at it 20-25 years. When she started, she was shown a training film and assigned a territory. She considers herself lucky: her 8-square-blocks territory is in her own neighborhood—others must drive to their territories. She is allowed to sell to friends outside her territory, but can't seek other business there.

Mrs. Miller works 4 hours a day, 5 days a week, earns about \$20. Out of this she must pay for catalogs, samples and demonstration materials.

On one out of two of her "cold" calls, she will make a sale. The average sale is about \$3 retail, takes 15 minutes to close. Mrs. Miller calls on each customer once every 6 weeks, often gets additional repeat business when customers phone her.

She and other saleswomen in her area meet with the district manager eight times a year and informally exchange ideas on how to sell.

Mrs. Miller likes selling for Avon. She enjoys meeting people, likes the Avon line because she thinks it keeps up with new product trends, because the company backs her up with advertising, and because money-back guarantees makes it easier for her to sell.



## Ultrawet formulations clean quicker, sell faster

Name any number of best-selling detergents and you'll find that most of them use Atlantic Ultrawets. Formulations made with Atlantic Ultrawets do a better cleaning job because they are tailored to meet the compounders' specific needs; they *sell faster* because they do the job efficiently and easily.

The high performance characteristics of the Ultrawets afford maximum economies while maintaining formulation quality. For further economy, deliveries of Atlantic Ultrawets can be made at significantly lower prices in tank car or bulk quantities.

Ask us for detailed information on the Ultrawets. Our experienced sales engineers will gladly help you develop a formula of your own—for *any* cleaning need. Write or wire The Atlantic Refining Company, Dept. 44, at the nearest office listed.

**ATLANTIC**

**PETROLEUM  
CHEMICALS**

*The Ultrawets wet,\* penetrate, clean, emulsify*

Philadelphia, Providence,  
Charlotte, Chicago

In the West  
L. H. Butcher Co.

In Canada: Naugatuck Chemicals  
Division of Dominion Rubber  
Company, Ltd.

In Europe  
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Antwerp, Belgium

In South America  
Atlantic Refining Company  
of Brazil, Rio de Janeiro



# News

Wherever CORROSION RESISTANCE is a Factor



## THIS Y-VALVE\* SHUTS OUT CORROSION

... because every surface in contact with solution is made of corrosion resistant Haveg plastic! Exceptional moldability and machinability of Haveg permits these additional advantages for longer, corrosion-free valve service:

- Full valve opening for **fuller, straighter flow** !
- Guided stem for **positive seat alignment** !
- Smooth, sliding stem action permits **lower packing pressure—longer packing life** !
- Double threaded stem for **faster valve control** !
- Removable seat and stuffing box for **easy maintenance** !
- Valve seats in full open position and can be re-packed in this position **while in operation** !

Haveg Y-Valves are available in standard pipe sizes, complete with asbestos-graphite unless otherwise specified and can be equipped for easy connection to air, diaphragm or motor-operated control equipment. Discuss your requirements with a Haveg corrosion engineer.

\*So does this diaphragm valve—ask for data on it, too.

H-007

HAVEG PLASTICS OF TOMORROW SOLVE YOUR CORROSION PROBLEMS TODAY

### HAVEG INDUSTRIES, INC.

920 Greenbank Road, Wilmington 8, Delaware  
Factory: Marshallton, Del. phone WYman 8-2271

Atlanta  
Exchange 3821

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(Wheaton)  
Wheaton 8-3225

Cleveland  
Washington 1-8700

Detroit  
(Livonia)  
KZwood 1-1785

Houston  
Jackson 2-6840

Los Angeles  
Mutual 1105

New York  
(Westfield, N.J.)  
Westfield 2-7383

Seattle  
Main 9006

Denver  
BEmont 7-0433

## SPECIALTIES

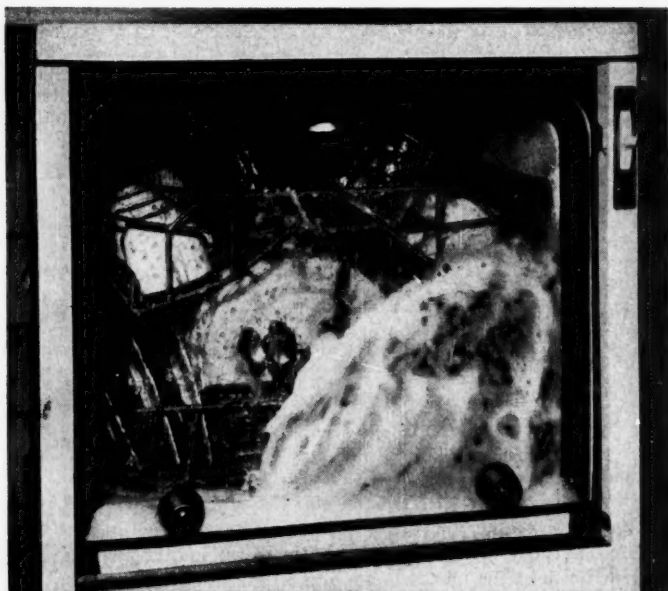


Stanley is concentrating on the industry's eternal problems. Chief among these is building and maintaining a sales force. Direct sellers have found from experience that sales can be expected to rise or fall in direct proportion to the number of salesmen they have. Stanley has about 30,000, of which about 15,000 stay with the company over one year; to maintain a maximum force, it tries to hire 30,000 more each year. Fuller's personnel turnover is comparable: to keep a force-level of 7,000 it must hire 15,000 a year. Beauty Counselors hires 10,000 a year to keep 8,000.

Naturally, recruiting this many people for straight-commission jobs when salaried jobs are plentiful is tough. "You can't be too particular whom you hire. If she walks, talks, and tells the truth, we can use her," says Stanley's marketing director, Charles McPherson.

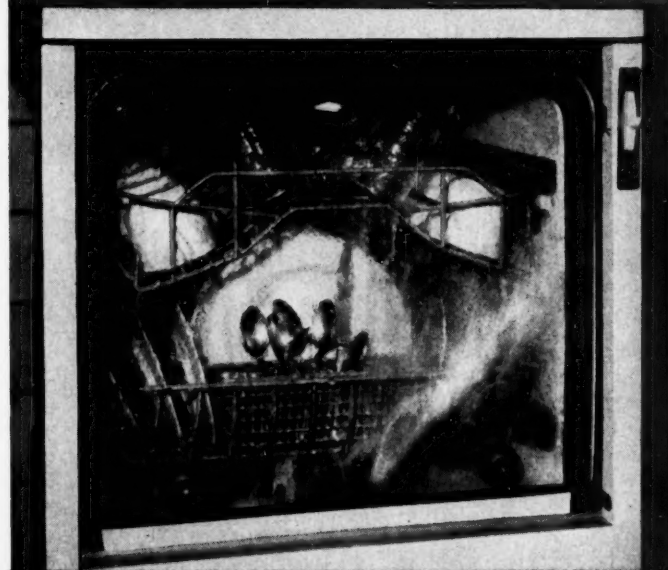
**Short Work:** Ideally, the door-to-door salesman should have a college background, be a good earner in other jobs, says the National Assn. of Direct Selling Companies (Winona, Minn.). Actually, some 28% are college graduates, most of whom work on a part-time, temporary basis because they need extra money. Even if they get through the first three-four weeks of selling—the period when most of the weak-willed drop out—they will work only until reaching their money goals. A survey recently taken by NADSC reveals that 40.9% of the salespeople have been at it 1 year or less, but only 2.4% have been selling 2 years; 7.2%, 3 years; 5%, 4 years. The percentage drop continues year by year.

Obviously, if more people would stick with direct selling, companies would have less of a personnel problem. Much of their effort goes to en-



**Conventional low-foam Detergent**

Notice excessive foam 3 minutes after beginning of wash cycle.



**TRITON CF-10**

Notice how suds are controlled (after same length of time) for better dishwasher operation.

# End Excessive Foam with High-Detergency **TRITON CF-10**

Detergents containing TRITON CF-10 do not foam excessively even when violently agitated. The result is that automatic dishwashers can do their job better, and kitchenware rinses clean without streaks or spots. At the same time, TRITON CF-10 has such excellent detergent properties that it effectively removes soil from the hardest-to-clean plastic ware. Investigate TRITON CF-10 for your cleaning compounds today.

TRITON is a trade-mark, Reg. U.S. Pat. Off. and in principal foreign countries.

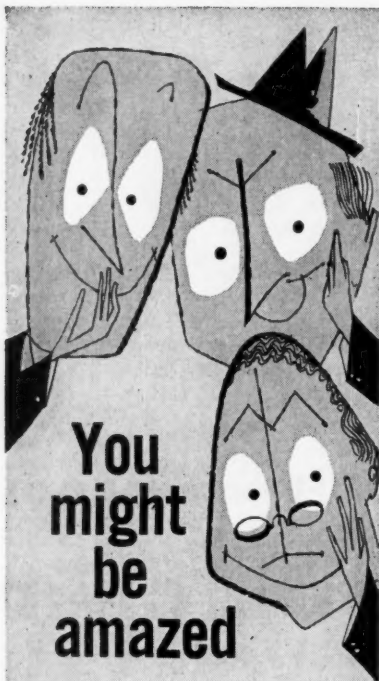


*Chemicals for Industry*

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**You  
might  
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Remarkably versatile Supergum H  
improves products, processes  
for thousands of manufacturers

This modified vegetable gum, prepared in  
the form of cold water-soluble powder,  
means many things to many manufac-  
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**SOAPS, DETERGENTS**—as a soil sus-  
pending agent added to the product or  
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patible with other binders and fillers.  
Improves tensile strength and printability.

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**RESINS, PAINTS, LATEX**—in combina-  
tion with glues, starches, and gums, it  
gives good adhesion to cardboard, wall-  
paper, glass, aluminum surfaces.

**CERAMICS**—as a binder or foundry-  
core binder.

**SPRAYS**—as sticking agent or adhesive  
in insecticidal or other sprays.

**COSMETICS, PHARMACEUTICALS**—as  
a stabilizer and thickener.

Supergum H may improve your product  
or process, too! Write for test sample  
and further information. No obligation,  
of course.

**JACQUES WOLF & CO.**  
*Chemicals* PASSAIC, N.J.

Plants in: Clifton, N.J., Carlstadt, N.J., Los Angeles, Calif.

## SPECIALTIES



couraging salesmen to keep selling. Beauty Counselors eases its women into selling by having them start out by calling on friends, rather than being assigned a territory. The friends are given free lipsticks for names of four of their friends, and, in turn, the circle widens. Stanley parties are set up much the same way.

**Assured Sales:** Probably more im-  
portant is assuring that the salespeople  
will make money, get frequent, sizable

orders. Little training is given new people; it seldom amounts to more than having the trainee accompany the unit manager on two or three calls or parties. Instead, efforts are made to provide salesmen with foolproof systems and readily salable merchandise.

Partly to help salesmen make more money, partly to make better use of such people as they do have, many firms have come up with ways to get more sales with less time. Stanley's party is one example. A saleswoman can deliver her pitch simultaneously to about eight women—each of whom will influence the others to buy. Such a spiel will generally earn her \$10 profit. Fuller finds that by depending on a carefully designed catalog to do most of the selling, its men can make up to 50 calls a day. The Fuller Brush man sees the customer three times: to leave the catalog, to get the order, to deliver.

**Walking Supermarket:** Diversifica-  
tion, one of the biggest trends in the  
industry is intended to help salesman



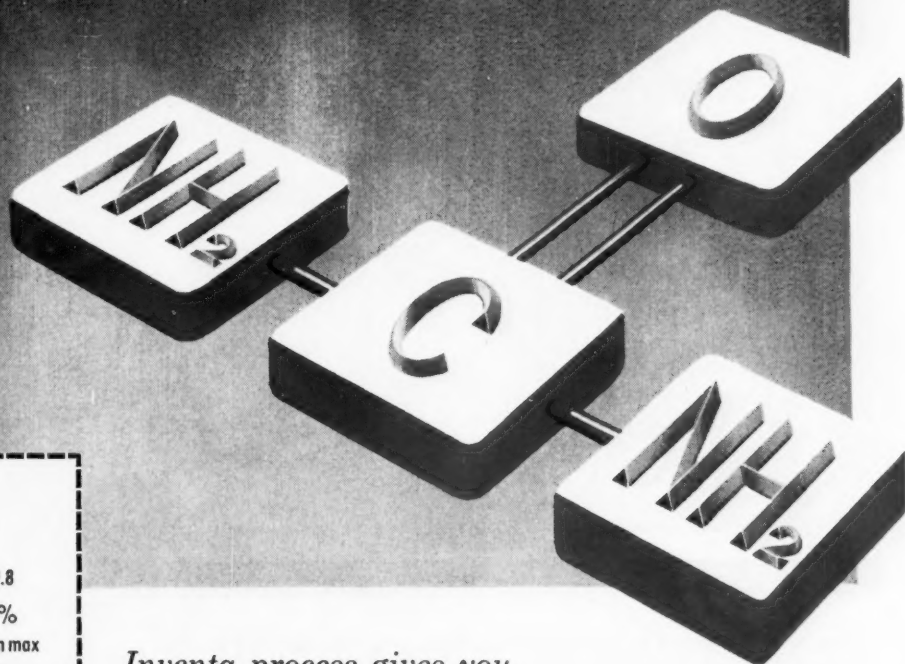
## U.S. Products Make Polish Stand

It's evident from the picture above that although American ideas may have a hard time taking hold behind the Iron Curtain, the same can't be said for American goods. Various U.S.-made products, ranging from nail polish to whiskey, are available for the shopper at this corner stall in Warsaw, Poland. Besides such chem-

ical specialties as Palmolive soap and Colgate toothpaste, the picture shows such stand-bys as Mennen's baby powder, Waterman's ink, Pond's face cream, and Toni home permanent wave outfit. The open-air market operates as a free trade shop in contrast with the state-owned shopping center.

# urea

by Sohio



## SPECIFICATIONS

PH.....	7-9.8
Water.....	0.5%
Ash.....	35 ppm max
Iron.....	2 ppm max
Free Ammonia.....	175 ppm max
Color.....	10 APHA
Turbidity.....	20 ppm max

## PHYSICAL PROPERTIES OF UREA

Molecular Weight.....	60.06
Boiling Point.....	Decomposes
Melting Point.....	132.7 C
Specific Gravity.....	1.335
Heat of Fusion.....	57.8 cal./gram
Heat of Solution in H <sub>2</sub> O.....	57.8 cal./gram

*Inventa process gives you*

## high-quality urea in prill form

SOHIO's 120-ton per day urea unit is the first in the United States to use the Swiss Inventa process. This process with its specially lined reactor eliminates corrosion and metal contamination, resulting in a dependable supply of highest-quality prilled urea.

What's more, every phase of

Sohio's production is electronically controlled — monitored and logged — to insure high-quality chemical grade urea.

Be sure to contact Sohio first for quality chemicals. A qualified representative will be glad to call on you in person. Prilled urea samples are yours for the asking.

WE'RE SERIOUS ABOUT  
SERVICE AT SOHIO



**SOHIO CHEMICAL COMPANY**

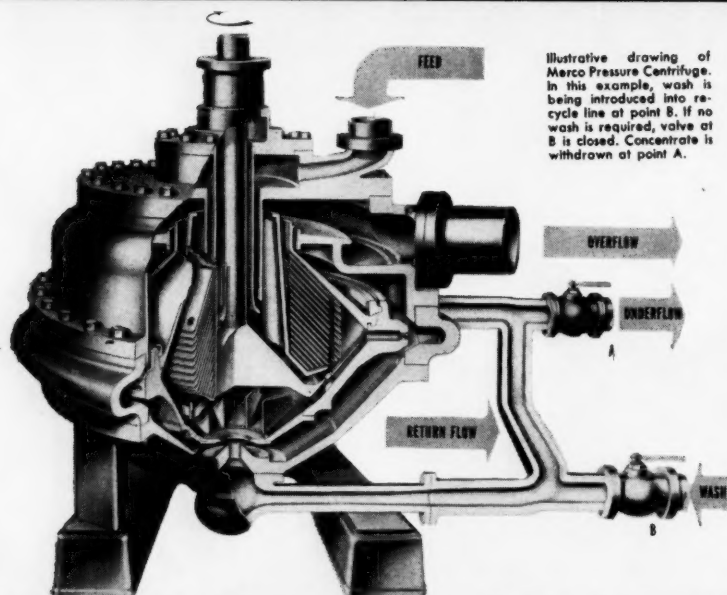
FT. AMANDA RD., P. O. BOX 628 • LIMA, OHIO

**High-quality industrial chemicals:** 83% Ammonium Nitrate Solution . . . Nitric Acid . . . Urea . . . Aqua Ammonia . . . Anhydrous Ammonia (commercial and refrigeration grades)

# NOW

*Centrifugal Separations  
under pressure conditions  
with the new*

## Merco Pressure Centrifuge



Newest development in wet processing equipment, the Merco Pressure Centrifuge is designed for all continuous centrifuging applications at pressures up to 110 psi. Key to pressure operation is a specially designed housing closure that has been exhaustively tested at pressures two to three times the guaranteed figure of 110 psi. Equally important, this new unit incorporates the unique Merco "Return Flow" principle for maximum operating flexibility. Under centrifugal forces thousands of times higher than gravity, even the smallest particles in the feed "sink" rapidly outward and are continuously expelled through fixed open nozzles in the rotor. A controlled portion is withdrawn as finished concentrate and the remainder becomes a return flow to the rotor. Wash, if desired, is introduced to the return flow line . . . clear, excess liquor overflows out the top of the unit.

If there's a step in your flowsheet involving concentration, washing, clarification, soluble recovery, or classification *under pressure*, there is a good chance that this new tool will prove useful. Bulletin No. 2600, just off the press, describes the Merco Pressure Centrifuge in detail. For your copy, write Dorr-Oliver Incorporated, Stamford, Conn.



Merco T.M. Reg. U. S. Pat. Off.

### DORR-OLIVER

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## SPECIALTIES

and company get more per call. It has turned out particularly well for specialties makers. Fuller added a cosmetics line in 1948, recently added a vitamin line, is looking for other possibilities. Fashion Frocks, Inc. (Cincinnati), a door-to-door concern reputed to be the world's largest dress maker, added cosmetics a year ago and it has already added a quarter-million dollars to its wholesale sales.

The best way to a doorbell ringer's heart, however, is to give him a self-selling product. One door-to-door expert flatly states that a suitable product must be one that a new man can sell a fair amount of on his first day.

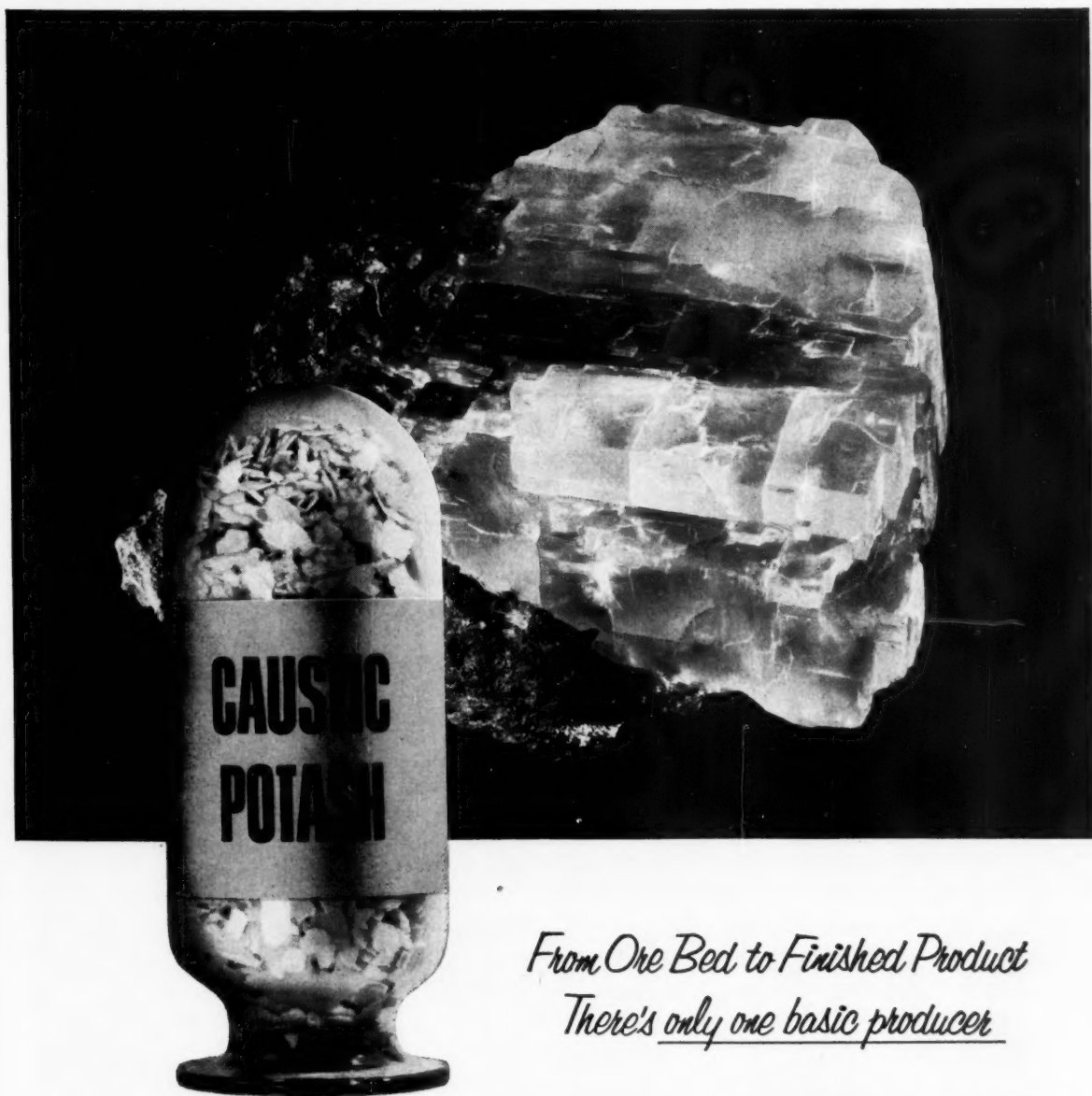
**Cost Plus:** Aside from near-universal appeal, the most important requirement for the product is that it can justify a slightly high price-tag. "If we can't equal a conventional retail price at \$1.62," one sales executive says, "we make the product worthwhile at \$1.82."

Direct selling is expensive, even though salesmen are paid a straight commission. The commission can go as high as 40%; but even if it averages only about 25%, as it does with Fuller, direct selling costs more. Reason: the tremendous overhead at the district manager's level—something that's needed to keep large field forces in action. The money goes for recruiting, bookkeeping, maintaining numerous branch offices, and shipping goods direct to salesmen.

For this reason, you need a product that has low manufacturing and high distribution costs—a set of qualifications that cosmetics and other chemical specialties fit perfectly. Other products need something to take them out of price competition, allow a high margin. This is usually done by adding special features (preferably something demonstrable), promoting hidden qualities—an area where personnel selling is particularly useful, or by simply having a product whose price can't be judged by the customer.

Being more expensive, the product should, of course, be of reasonably high quality.

**Do-It-Yourself:** To insure high quality—and low cost—Avon, Stanley, Fuller and Beauty Counselors make most of the products they sell. Fuller currently buys its cosmetics from Daggett & Ramsdell, but expects to be producing its own by the end of the year. The main problem of



*From Ore Bed to Finished Product  
There's only one basic producer*

## INTERNATIONAL MINERALS & CHEMICAL CORPORATION

### **MINES**

SYLVITE ORE - KCl and NaCl

### **REFINES**

POTASSIUM CHLORIDE - KCl

### **MANUFACTURES**

CAUSTIC POTASH - KOH

You get important "extras" from International, the *one basic producer of Caustic Potash*. Unquestioned security of supply. Uniform quality. High purities. All standard grades. Prompt shipments.

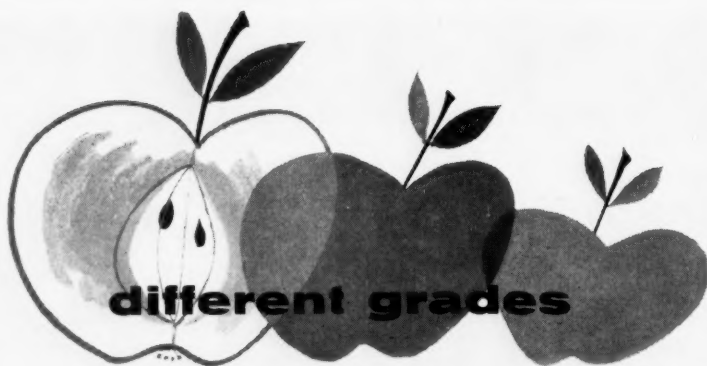
99.95+% pure electrolytic grade KCl is refined at Carlsbad from sylvite ore and shipped to Niagara Falls for the production of KOH and other potash salts. Call the office near you for fast service.

CAUSTIC POTASH • CARBONATE OF POTASH • POTASSIUM CHLORIDE  
MAGNESIUM OXIDE • LIQUID CHLORINE • MURIATIC ACID  
SULFATE OF POTASH • HYDROFLUOSILIC ACID



**POTASH DIVISION** INTERNATIONAL MINERALS & CHEMICAL CORPORATION • GENERAL OFFICES: 20 NORTH WACKER DRIVE, CHICAGO 6 • 485 LEXINGTON AVENUE, NEW YORK 17 • MIDLAND, TEXAS • FULTON NATIONAL BANK BUILDING, ATLANTA, GA.

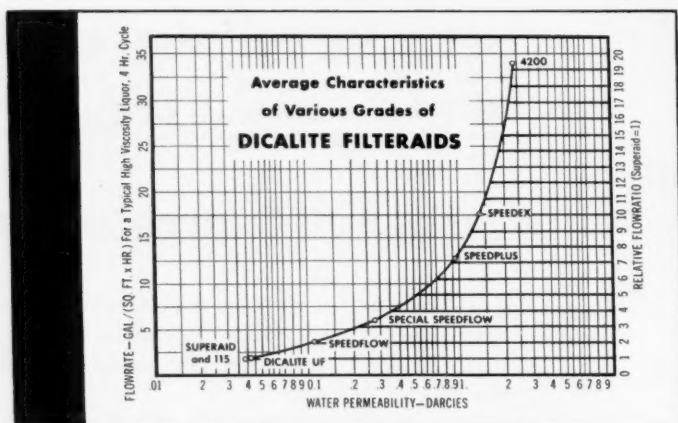
February 16, 1957 • Chemical Week



...but just one quality!

**F**ilteraids and certain kinds of fruit have this one thing in common—that *grade* is a matter of size, and has no reference to quality. The smaller fruit may be the equal of the larger in everything but size.

Filteraid quality means the highest possible degree of clarification for the grade employed, at greatest throughput per quantity of filteraid. Dicalite achieves this high quality—in every grade—by (1) careful selection of the crude diatomite from Dicalite's four high-grade deposits; (2) processing with the industry's most modern equipment, and (3) the industry's most rigid quality control system, which assures the same carefully controlled particle size range and distribution for each grade, uniformly, dependably, lot after lot. Which may explain why so many leading firms in every branch of processing have standardized on Dicalite Filteraids.



**DICALITE HAS SEVEN GRADES OF FILTERAIDS  
...BUT ONLY ONE QUALITY—THE FINEST!**

For more complete information, write

*Dependable*  
**Dicalite**  
DIATOMACEOUS MATERIALS

dicalite division, great lakes carbon corporation 612 south flower st., los angeles, california

## SPECIALTIES

these integrated firms is balancing manufacturing capacity against sales. Stanley, for example, has some of the most automated aerosol lines in the country; but it found it was operating at only 40% capacity—the dealers just weren't pushing the aerosols hard enough.

In a case like this, all Stanley—or any other direct-selling house—can do about its salespeople is to urge them, persuade them or inspire them—it can't order them. The salespeople themselves are almost invariably independent agents who buy and resell. The companies, to avoid having to pay social security, withholding income taxes, doing other employee bookkeeping—all of which would add to their overhead—prefer to accept the concurrent drawbacks of the independent-agent sales approach.

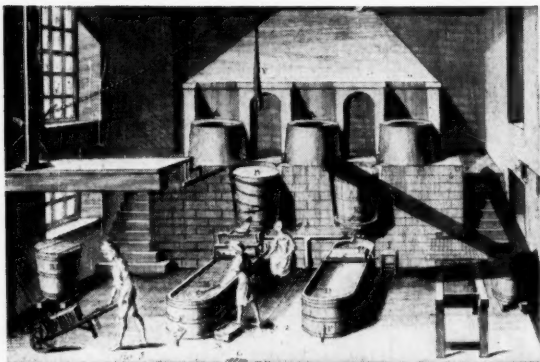
Many companies that sell door-to-door look forward—if not eagerly, at least with a confident smile—to the end of prosperity. Most of them made big gains during the depressed '30s. Reason: in bad times or good, the rule holds true that sales are in direct proportion to the number of salesmen. Naturally, during hard times, when the more-secure salaried jobs are hard to find, more people knock on the doors of the direct-selling concerns.

Some disagree, pointing out that when people are shy of money they avoid the higher-priced door-to-door goods. But, Stanley's McPherson, who says he recognizes only challenges, not problems, probably speaks for the majority when he says that for direct sellers, "a depression would 'solve' some of the challenges."

## Reclaimed Market

There's simple explanation behind the current success of Rexton Finishes, Inc.'s new coating, Rexclad. The Irvington, N.J., firm took the finish to plastics molders, showed them how a one-step application of the coating could reclaim otherwise-rejected thermosetting resin products.

Rexton, a seven-year-old firm specializing in industrial finishes, came up with its Rexclad material a little over a year ago. Based on readily available epoxy resins, the coating wasn't alone in its field, nor were the properties of epoxies—exceptional adherence, toughness, abrasion-resistance—unfamiliar. But in selling the finish, Rex-



## Important new things are happening to waxes



Wax, almost as old as civilization itself, is now being remarkably up-graded and improved by combining it with the newest of polymers, A-C POLYETHYLENE. This low-molecular-weight, low-viscosity polyethylene easily and economically up-grades both paraffin and microcrystalline waxes, replaces costly vegetable waxes.

Because A-C POLYETHYLENE handles as easily as wax, there's no need to change processing methods... you can blend it on all conventional

equipment whether for hot melt or emulsification processes. And, A-C POLYETHYLENE is low in cost, uniform in supply and quality.

#### Added to waxes, A-C Polyethylene improves:

blocking	glass	scuff resistance
color intensity	hardness	water resistance
coverage	mileage	tensile strength

#### Further, A-C Polyethylene helps:

- decrease slip
- reduce bulging and leaking in dairy cartons
- aid weatherproofness of building materials
- protect yarns and fibers in textiles and paper

Check this list for industry-proved applications of A-C Polyethylene; then investigate its advantages in your formulations:

Asbestos shingles	Leather
Bottle cap liners	Linoleum
Boxboard containers	Metal powder lubricants
Candies	Paints, lacquers and varnishes
Carbon paper	Paper, coating, laminating and sizing
Color dispersants	Pharmaceuticals
Cosmetics	Plastics
Crayons	Polishes, liquid and paste
Dairy cartons	Potting compounds
Fibre drums and cups	Printing ink
Fruit and vegetable coatings	Textile size
Glass bottle coatings	Tile, asphalt, cork and rubber
Industrial coatings	Wax blending
Insecticide spray	Wire and cable
Investment waxes	

Write on your letterhead advising us of intended use. We will send you data sheets and samples of the appropriate grades of A-C POLYETHYLENE.

# **A-C Polyethylene**

## **SEMET-SOLVAY PETROCHEMICAL DIVISION**

Allied Chemical & Dye Corporation

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## SPECIALTIES

ton used some novel approaches.

It studied the problems of molders of thermosetting resin products, found two big problems: for those using phenolics, the handicap was that phenolic articles are invariably dark-colored—and bright, light colors are sought after nowadays. Those using easily colored melamine on the other hand, had as their major complaint, the cost of scrapping articles whose finish wasn't up to standard.

Rexton then demonstrated how its coating adhered durably to phenolics, making possible low cost but colorful, molded articles. And it showed that the same coating, applied to poor-color melamine items, made useful products out of rejects.

To tell this story to plastic molders, Rexton brought word of its developments to *CHEMICAL WEEK* and *Modern Plastics* magazine. Brief news items in these publications brought in nearly 2,000 inquiries.

Next, Rexton began telling basic manufacturers of molding resins about the coating, and those firms helped spread the word about Rexclad. Durez was the first to give the material a plug; more recently, Bakelite has given it valuable publicity.


The plan has paid off. Rexclad finishes now make up nearly 15% of Rexton's business, and its sales have climbed substantially this year.

The firm has uncovered still more uses for its Rexclad—it can be used in place of plating metal, and to add color cheaply to thermoplastic resin articles. As Rexton sees it, the finish is just beginning to show its potentialities.

## PRODUCTS

**Test Passed:** Grip-Kote, a floor wax previously sold only industrially, has passed its first household-market tests in Florida. The wax, made by Continental Car-Na-Var Corp. (Brazil, Ind.), sells for \$1.59/qt., \$4.98/gal.

**Harder Hard Goods:** To obtain a harder, tougher surface on hard goods such as refrigerators, automobiles and metal furniture, the paint industry has available two new resins. American Cyanamid Co., says the materials offer "exceptional impact resistance with outstanding chemical resistance and maximum hardness." They are called Cyzac 1006 and Cyzac 1007.



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Liquid 50%, Regular  
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Flake, Solid and Ground, 76% Na<sub>2</sub>O

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### SODA ASH

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Westvaco alkalis are engineered to meet the user's needs. For each alkali produced, statistical determinations are made of the allowable quality variations. Rigid limits are set on key variables known to be of vital concern to the customer. Strict controls over processing maintain these standards and each shipment is analyzed to make sure it meets specifications.

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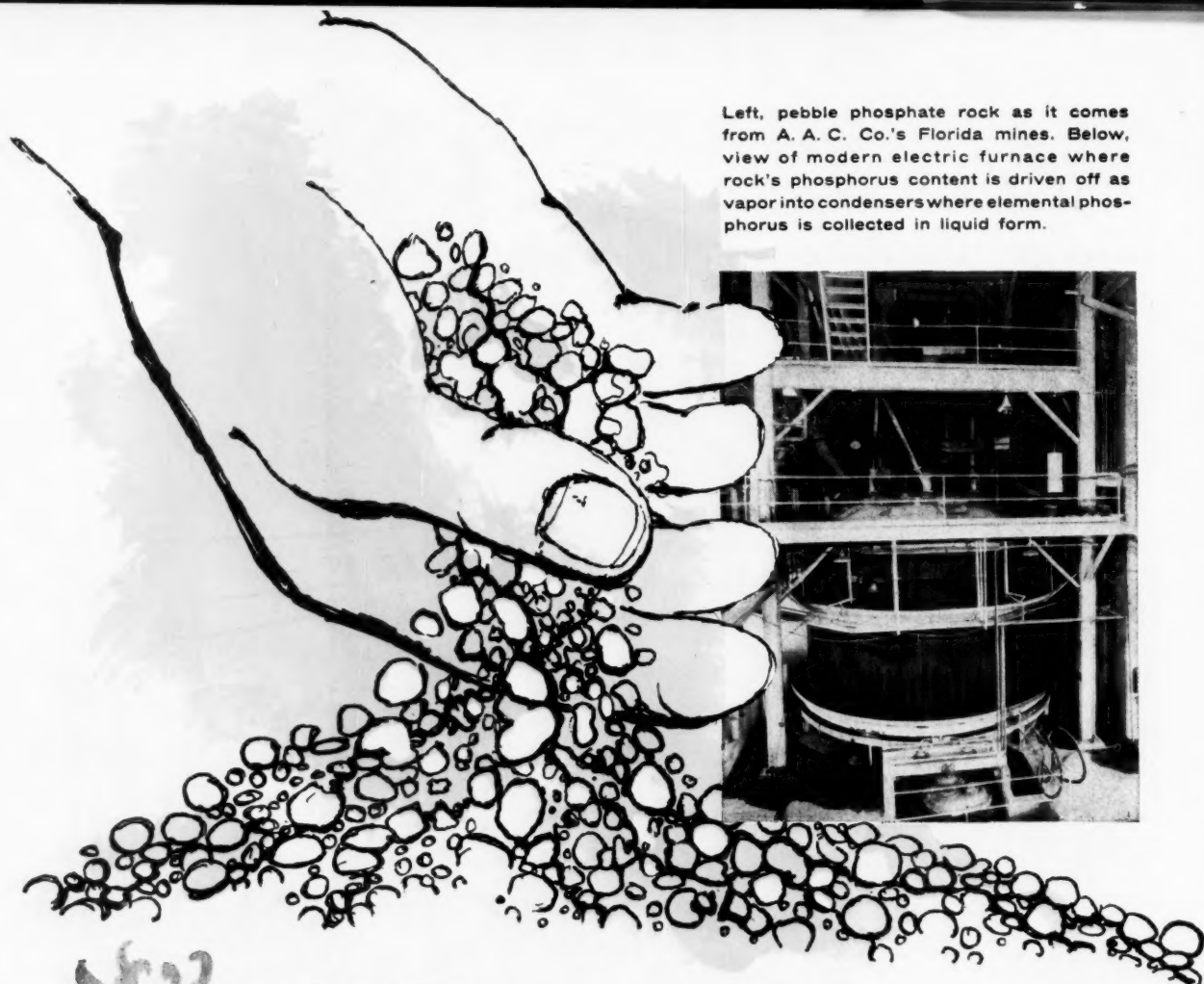
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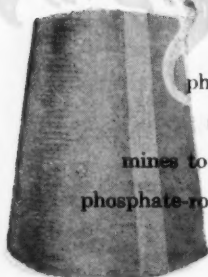
February 16, 1957 • Chemical Week



Left, pebble phosphate rock as it comes from A. A. C. Co.'s Florida mines. Below, view of modern electric furnace where rock's phosphorus content is driven off as vapor into condensers where elemental phosphorus is collected in liquid form.

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Keystone Ammonium Carbonate  
Sulphuric Acid • Insecticides-Fungicides

# Technology

## Newsletter

CHEMICAL WEEK  
February 16, 1957

**USI is experimenting with an extra refining step** to include in its zirconium production line. It is contemplating an induction melting to drive off the sodium contained in the zirconium sponge. The remaining molten material is then allowed to drip onto a whirling disc where it's thrown out and allowed to solidify.

This is the background: when zirconium (or titanium) is made as sponge, it contains some of the reducing agent and other impurities along with it. In Kroll-process plants, the makers drive these impurities off with a vacuum distillation. (Titanium Metals uses an acid leach, which is cheaper but, most feel, not so efficient.)

It is believed that USI thought that since it was using sodium as reducing agent, it could get by with a simple water leach. However, it has not been able to turn out a product that meets AEC specifications in that way. So it is going to use the extra refining step.

The firm isn't saying much about the project right now. It does indicate that the steps it is contemplating adding to the line will not add significantly to the cost of the product, nor will they be anything as costly as a vacuum distillation. Too, Distillers says it will turn out a product that not only will meet AEC specifications but also will be "better than any zirconium previously made on a commercial scale."

•

**Bromelin—the proteolytic enzyme recovered from pineapples** by Dole Hawaiian Pineapple Co., Ltd.—will be marketed by Takamine Laboratory (a division of Miles Laboratories). The Hawaiian firm revealed last fall that it would make the enzyme available (*CW Technology Newsletter*, Sept. 8, '56), is now "in limited commercial production" at Honolulu, and is expanding.

•

**The world's first nuclear power station is having some trouble.** But it's nothing that a little engineering can't fix. That's what Sir Christopher Hinton, managing director of Britain's Atomic Energy Authority, told a London press conference last Friday.

Located at Calder Hall, the plant was started up last fall (*CW*, Oct. 20, '56, p. 74). But it's been having difficulties with its lower fuel element: due to the irradiation, the creep was higher than anticipated. (Although there were no facilities available to simulate the reactor conditions when design was undertaken, some later research at Harwell indicated there might be such difficulties.)

Hinton, however, says that a cure has been found, and the British are now able to side-step the difficulties. Says he: "The more work we do on the Calder Hall type of reactor, the more promising it appears to be."

## Technology

### Newsletter

(Continued)

**A group of Midwest utility companies plan a nuclear power** station to utilize a controlled recirculation boiling-water reactor (CRBR) engineered by Allis-Chalmers. Subject to approval by AEC, the nuclear station will have a capacity of 60,000 kw., will cost \$20-25 million, and will be completed by 1962. Site will be chosen by Northern States Power (Minneapolis), which will own and operate the plant.

This is how the CRBR will work: nuclear heat will be used to generate steam directly at 488 F. This will pass through superheaters—fired with conventional fuel—where it will be raised to 1000 F at 540 psi. Then it will be sent through the turbines.

The presence of water in the core is essential to the operation of the reactor. If the reactor starts going too fast, it drives off more water, and, in effect, slows itself down. And, thus, the whole system can be controlled simply by regulating the rate at which exhaust steam from the system is recirculated to the reactor.

•

**Diamond Alkali and Ionics, Inc., have teamed up** to form a research partnership. Ionics, which specializes in electrolytic ion-exchange techniques, will continue “independently to pursue its interests in the fields of water conditioning, ion-exchange treatment of sugar . . .”

In the new tie-up, Ionics will devote all its “uncommitted research efforts to Diamond’s interests.” Diamond has purchased 25,000 shares of Ionics stock from American Research and Development Corp.

•

**Another new research venture** has been set up to work on development of aluminum pastes and powders for use as pigments in plastics, paper coatings, printing inks and fabric finishes. It was formed by Sullivan Powdered Metals, which will cooperate with the research labs of Alcoa. Thomas Sullivan, head of the new organization, points out that these powders and pastes have already been used to some extent in the graphic arts field. But he feels they’ve been held down because of the specialized testing required. He plans to carry stocks of these special blends for the basic industries. But for the most part, the new division intends to concentrate on new formulae for combining aluminum with other materials.

•

**A new technique for treating cotton with acrylonitrile** has been developed by Irvin Gottlieb of the Textile Research Institute (Princeton, N.J.). The method is said to improve the rot resistance of cotton fiber in a manner comparable to cyanoethylation—but without any special equipment. (A closed dye machine will do it.) Gottlieb’s technique does not modify the fiber; it coats it with a layer of polyacrylonitrile.

## Helpful answers to CAUSTIC QUESTIONS

As a leading producer of Caustic Soda, Columbia-Southern is asked many questions every month about this versatile, widely-used alkali. While the answers probably are not completely new to every Caustic Soda user, they do re-emphasize certain basic points that shouldn't be forgotten. We hope that you will find this series interesting and helpfully informative.

### What is the necessary raw material for Caustic Soda?

Plentiful supplies of brine are required for the electrolytic production of Caustic Soda. This process also liberates Chlorine as a co-product. An electric current is passed through a sodium chloride brine solution contained in specially-designed cells. A 10-12% Caustic Soda solution forms at the cell's cathode. This low concentration liquor is evaporated to yield the various concentrations desired.

### Is Caustic Soda an element?

No. Caustic Soda is a compound of sodium, hydrogen, and oxygen. It is known chemically as sodium hydroxide, and is commonly called lye.

### How much liquid Caustic is now produced?

Latest six-month figures for the January-July 1956 period set the production of liquid Caustic at 2,169,368 short tons for electrolytically manufactured, 260,899 short tons for lime-soda process.

### What type of pumps are recommended for the transfer of Caustic liquor from tank cars to storage, and from storage to the point of use?

Centrifugal pumps do the job best. All-iron construction with no brass or bronze fittings is generally preferred. For high temperature use, nickel or nickel alloy pumps will give longer service and the liquor will show less metallic contamination.

### Who currently uses the most Caustic?

The chemical processing industry itself is by far the largest group user of Caustic, consuming roughly 25% of all production. Rayon and film producers rank second, followed by such large volume consumers as the petroleum refining, pulp and paper, cleaners, soap, textile, metals, vegetable oils, and rubber industries.



SOME OF THE WORLD'S DEEPEST BRINE WELLS, operated by Columbia-Southern to supply the New Martinsville, W. Va., Caustic Soda-Chlorine plant, draw salt brine from depths of a mile and a quarter.

### How much water is required to dilute a tank car of 73% Caustic solution to a more easily stored 50% concentration?

About 6,100 gallons of dilution water are needed to bring an 8,000 gallon tank car of 73% down to 50% strength; 7,650 gallons of water to dilute each 10,000 gallon car.

### How can each user determine the most economical grade and form of Caustic to buy?

Much, of course, depends upon the user's end product and processing requirements. Solid, standard flake, 50% and 73% solution, all have certain advantages. Processing advances, transportation developments and freight rate changes, however, dictate a periodic review of your purchasing. Columbia-Southern will be happy to look for economies you might well realize . . . at no obligation to you. Call, write or wire our Pittsburgh address for the prompt services of experienced Caustic Soda specialists.



## COLUMBIA-SOUTHERN CHEMICAL CORPORATION

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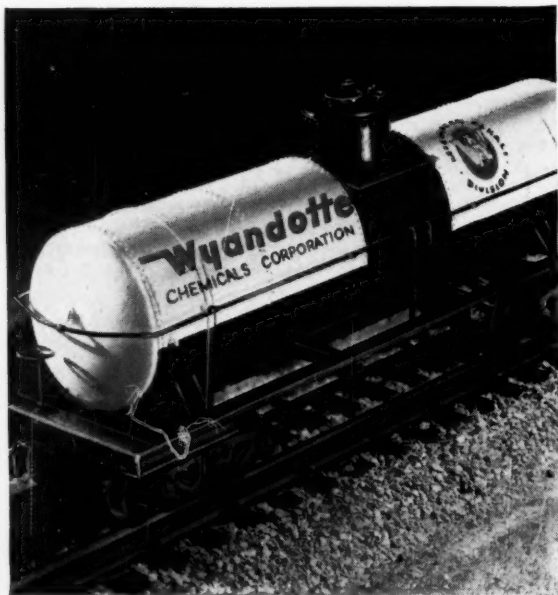
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IN CANADA: Standard Chemical Limited and Its Commercial Chemicals Division

# New Wyandotte chart helps you choose between 50% and 74% caustic soda

Like to make a definite decision whether or not switching from 50% to 74% caustic soda would be profitable for your business?

To make this task easier for you, Wyandotte has devised a unique chart which helps you plot your economic position, and shows you whether switching from 50% to 74% liquid-caustic solutions can benefit you in your operations.



*Wyandotte's caustic liquor is loaded while hot. This heat, plus heavy insulation, insures users against solidification.*

In choosing, there are many variable factors which you must consider: the cost of concentration; end use of the caustic soda; existing storage and handling facilities; quantity of caustic consumed; plant location.

While there are definite freight savings to be realized from using 74% caustic (less water must be shipped), if the final use of the caustic requires a dilute solution, equipment must be provided to dilute the tank car of 74% liquor. And since the dilution operation results in approximately 70% more total liquid, additional storage space may be needed.

A survey of your operations will reveal the possible savings that may be made by switching to 74% liquid caustic. Even though you may have surveyed operations previously, increased use of caustic or changes in freight rates may well mean you can save money now by switching to 74% liquor . . . it is wise to plan periodic surveys of your caustic requirements.

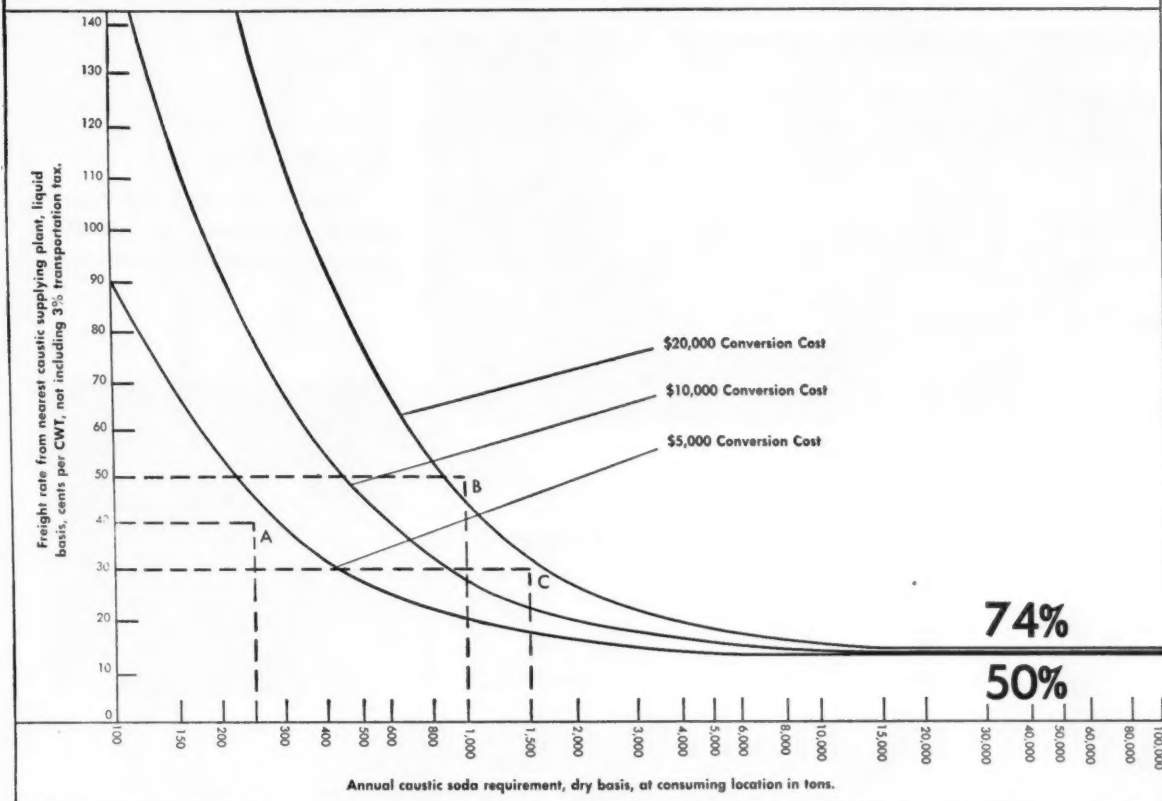
Our technical service representatives are experienced in solving problems concerning the type of caustic soda to be used, and will gladly aid you in making the necessary economic studies. For further information and help in choosing which is best for your business, get in touch with us today. *Wyandotte Chemicals Corporation, Dept. 565, Wyandotte, Michigan. Offices in principal cities.*

Exclusive Wyandotte Chart shows the zero advantage or equilibrium points for 50% or 74% caustic soda conversion assuming:

1. 5-year amortization

2. Price differential of \$2/ton

3. Federal transportation tax, 3%



## HOW TO USE CHART

**EXAMPLE A:** Freight from nearest producing point to consuming point is 40 cents per hundredweight. Annual consumption by consuming plant is 250 tons caustic soda, dry basis.

**ANSWER:** Because Point A lies to the left of the curves, the plant should purchase caustic soda as a 50% liquid.

**EXAMPLE B:** Freight from nearest producing point to consuming point is 50 cents per hundredweight. Annual consumption by consuming plant is 1000 tons caustic soda, dry basis.

**ANSWER:** Because Point B lies to the right of the curves, the plant should purchase caustic soda as a 74% liquid, even though additional equipment investment of as much as \$20,000 might be found necessary.

**EXAMPLE C:** Freight from nearest producing point to consuming point is 30 cents per hundredweight. Annual consumption by consuming plant is 1500 tons caustic soda, dry basis.

**ANSWER:** Because Point C lies between the \$10,000 curve and the \$20,000 curve, the plant should purchase 50% caustic soda if the additional investment necessary exceeds about \$15,000, or should purchase 74% caustic soda if the additional investment is less than about \$15,000.

**NOTE:** The amount of additional investment needed is based primarily on how much of the following items are presently part of the caustic soda unloading, storage and handling facilities at the consuming plant:

1. Storage capacity: A 10,000-gal. tank car of 74% caustic soda produces about 17,000 gals. of 50% liquor.
2. Dilution facilities: Water pump, caustic-soda pump, line-temperature gauges necessary to dilute 74% to 50%.
3. Cooling facilities: The hot 50% caustic soda must be cooled to about 110°F.-120°F. prior to storing the 50%.
4. Contamination: Some consuming plants would need protective linings or materials in the equipment to prevent contamination; thus, all-nickel equipment might be needed in some cases.

**Wyandotte CHEMICALS**  
MICHIGAN ALKALI DIVISION



SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA • CHLORINE • MURIATIC ACID  
CALCIUM CARBONATE • CALCIUM CHLORIDE • GLYCOLS • CHLORINATED SOLVENTS  
SYNTHETIC DETERGENTS • OTHER ORGANIC AND INORGANIC CHEMICALS

# RESEARCH



## Vicious dog

... resists examination and treatment by veterinarian, may tear off bandages, rip open surgical stitches.

## Tranquilizer

... administered orally here, may also be injected.



## Relaxed dog

... shows result of tranquilizer pill. Animal may now be handled easily, safely.

## Veterinary Medicine Gets Chemical Assist

Tranquilizers to calm vicious dogs is only one result of a stepped-up research effort in veterinary medicines. Also coming out of the animal-drug labs are new hormones, antibiotics and vaccines. In fact, the whole field of veterinary medicine is getting so big that sharp changes are in the making.

Right now, the market for ethical veterinary drugs is probably \$150-200 million/year. And that doesn't include the big business done in proprietary drugs and in feed supplements and growth stimulants.

As a result, the bigger pharmaceutical houses are taking more and more interest in veterinary medicines,

in marked contrast with former years, when the major suppliers of those items were small firms specializing in animal health goods.

This new interest is causing another change—in the research done and the types of products being brought out. Historically, the only drugs available for treating animals were those used primarily to treat humans. Fortunately for the livestock and pet population, most of the diseases that afflict animals have counterparts in human ailments. So the same research that brought out antibiotics and other new drugs also directly benefited the animals. But today, there's a noticeable



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Celanese emulsions produce tough, flexible, weather-resistant paint films that maintain their integrity, even after being immersed in water... they exhibit superior pigment binding capacities, with critical PVC's even higher than linseed oil... their fine particle size is the key to good tint retention and resistance to chalking, long required by the industry for more serviceable vinyl latex paints. All this, plus the

emulsions' low cost, mean greater efficiency and economy in the production of a far better, more competitively priced PVAc paint.

A Celanese Technical Representative will be happy to discuss the relative characteristics of Celanese CL-102 Homopolymer and CL-202 Copolymer and assist you with your interior or exterior formulations... with your plans for semi-gloss paints.

Write for your copy of the free manual that shows you how to find the big difference in emulsions. Celanese Corporation of America, Plastics Division, Dept. 163-B, 290 Ferry Street, Newark 5, N. J.

\*Celanese HQ\* not only stands for Highest Quality, but also for Headquarters for PVAc requirements. Celanese®

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plastics and resins

EXPORT SALES: Amcel Co., Inc. and Pan Amcel Co., Inc., 180 Madison Avenue, New York 16, N. Y.

# STEARATE HEADQUARTERS METASAP

There are ample and compelling reasons why Metasap, the nation's largest producer of stearates, is known from coast to coast as "Stearate Headquarters". The unvarying uniformity and extreme purity of Metasap Stearates are recognized wherever stearates are used. If you have special needs—Metasap is equipped to formulate custom-made stearates to meet them.

Our skill with stearates is complemented by our nation-wide distribution facilities. Whatever your needs, you'll fill them best by submitting them to "Stearate Headquarters"—Metasap.

#### Stearates of:

Aluminum Lithium  
Barium Magnesium  
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#### Also:

Aluminum Palmitate  
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**The Cleanest Stearates Made!**

## 'Lots of people take tranquilizers ... lots give them to their animals, too.'

trend toward developing products specifically for animals or for specific animal ill.

**Tranquilizers Up Front:** Lots of people take tranquilizers, and lots of them are giving them to their animals, too. Several of the tranquilizers now on the market are suitable for either animals or humans. But investigations already show that the mental drugs behave differently in different species. In some, they produce severe side effects (e. g., in dogs, diarrhea can be a major problem). In others, they have no effect at all.

So there's work now going on to modify the present drugs or to develop new ones that will perform effectively in each class of animal.

Returns so far show that dogs, in particular, react well to tranquilizers. And they're a big help in enabling the vets to handle vicious or frightened dogs, in alleviating car sickness and fear of lightning and thunder. They can also keep dogs from ripping off bandages or tearing surgical stitches.

Here's how Gerald Slade, Warner-Chilcott's veterinary division marketing director, looks at the market for animal tranquilizers: "There are 25 million dogs and 23 million cats in this country, and many of them are candidates for treatment. We're selling a lot more of our product than we ever anticipated. And uses that we never even thought about are constantly popping up."

Some that are being considered: treating cattle before shipping and thereby avoiding loss of appetite (and weight) in transit; treating zoo animals during long trips to side-step exhaustion, which leave animals susceptible to infection; soothing birds and calming race horses or jumping horses so they can be trained better.

**First Out:** The tranquilizer that Slade mentions is Paxital (a phenothiazine derivative), which, incidentally, was the first tranquilizer introduced specifically for animal use. (In this country, the drug is now being marketed for human consumption as Pacatal.) Paul Eichorn, W-C's technical director, and Joseph Fell, director of veterinary medicine, leaders in researching the

product, are not sure exactly how the product works. But they theorize that the presence of a piperidyl ring on the structure of the compound is its key. Further research is now in progress to develop and evaluate new homologs of the compound.

Other firms, too, are aware of the opportunities. Ciba, for one, feels that there's as much an opportunity for tranquilizers for animals as there is for tranquilizers for humans. It's conducting a heavy and concentrated study on Serpasil (reserpine).

Most of Ciba's work has been done on dogs, but it's also evaluating the drug for use on other animals. Moreover, Alfred Earl, director of veterinary research for Ciba, says that other alkaloids of *Rauwolfia* are being looked at for their effectiveness on dogs. He expects this research will uncover new animal tranquilizers.

Wyeth is pushing its Equanil (meprobamate), licensed from Wallace, for animal use. One disadvantage: it has poor solubility in aqueous solutions, is available only in tablets. This could make it difficult to administer to uncooperative animals. Wyeth is also trying Sparine (promazine) for vet purposes.

Although those three—Warner-Chilcott, Ciba and Wyeth—loom as the strongest in the field right now, others are readying products:

- Abbott Laboratories (whose veterinary products include antibiotics, anesthetics, steroids) has a long-range program for screening compounds for treating anxiety and other mental conditions. Abbott says that it is now busy devising new techniques in animal psychology to accumulate the data necessary for evaluation.

- Pitman-Moore says it has an animal tranquilizer research program, although it does not now have a product on the market.

- American Cyanamid, which does not sell a tranquilizer for human use, is negotiating with Wallace to obtain a license to sell meprobamate for veterinary use only.

**Hormones Galore:** The corticoid drugs, or steroid hormones, are also getting a big play in veterinary medi-

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## RESEARCH

cine. For example, they're useful in treating bovine mastitis, an infection of the cow's milk-producing glands, which, according to latest government figures, causes a \$230 million/year loss in the dairy industry.

Schering has recently brought out Metibiotic, a combination of Meticorten and two antibiotics—penicillin and streptomycin. And it is selling Meticillin, a combination of Meticorten and penicillin.

Upjohn, too, has a combination product for mastitis—Teatube Corbiot, a mixture of hydrocortisone with three antibiotics. The firm expects to concentrate much of its research on the mastitis problem. But it is also putting emphasis on other veterinary uses for adrenal steroids.

Pfizer is combining a hormone and a tranquilizer in Ataxaroid, made up of Sterane (prednisolone) and Atarax (hydroxyzine). And Abbott has a new veterinary hormone, Verrophin (pituitary gonadotrophin), for treating reproductive diseases in large animals, such as cattle and horses.

**Antibiotic Activity:** Although not so new in the veterinary picture as tranquilizers and hormones, antibiotics are still a big business and receive plenty of attention in the laboratory. Several newcomers that have just hit the market, or are slated for a debut soon:

- Hygromycin, a broad-spectrum antibiotic (*CW*, Oct. 27, '56, p. 36), specific to all five intestinal parasites of swine. It will be introduced this year by Eli Lilly (Indianapolis, Ind.).

- Warner-Chilcott's Triocil (*bis*-1, 3- $\beta$ -ethylhexyl-5-methyl-5-amino-hexahydropyrimidine), a broad-spectrum antibiotic ointment that combines antibiotic activity with fungicidal and parasitological properties.

- Gallimycin (erythromycin) is Abbott's most recent entry into its antibiotics line. It's intended for treating diseases in poultry.

**Ounce of Prevention:** Another important, though less well publicized area of veterinary research, is going on in vaccines. American Cyanamid's Farm and Home Division has been doing a lot of work along those lines. It has pioneered the use of the chick embryo method to produce vaccines against canine distemper, pigeon pox and rabies.

If all these research programs are fruitful, competition is bound to get even sharper.



NATIONAL RESEARCH COUNCIL LABS: For a colossus, new help.

## Canada's Research Boomlet

U. S. and British firms with Canadian subsidiaries are doing more of their research in Canada. But the amount is still relatively small.

That's the conclusion implied in research-spending figures newly prepared by the Dominion Bureau of Statistics (Ottawa): Canadian chemical products manufacturers spent an estimated \$10,135,587 on research last year—up 29.2% over 1955's \$7,844,984. Compared with the U.S. outlay of \$480 million in '56 (*CW*, Dec. 29, '56, p. 44), that's only a drop in the bucket. Even considering the difference in population (16 million vs. 167 million), Canadian research has plenty of room for growth, amounts to less than 25% of the U.S. expenditure, on a per capita basis.

In the past, most Canadian research has been shouldered by the National Research Council, whose huge Montreal Road Laboratories, four miles from Ottawa (*shown above*), operate for the various government departments. Canada, until less than a decade ago, had few well-staffed, well-equipped private research facilities. Now, industry is taking on more research jobs.

American and British companies with branch plants in the Dominion no longer depend completely on their central research arms at home.

Canadian chemical manufacturers have embarked on a vigorous expansion—

spending an estimated \$176.8 million for construction and repair last year, compared with \$95.7 million in 1955. And spending for new research laboratories is keeping pace.

Canadian Industries Ltd., for example, last year began construction of an ammunition laboratory (Brownsburg, Que.) and a plastics and coated-fabrics laboratory (New Toronto, Ont.), expects to finish them in 1957. Later this year, the firm will undertake construction of a new explosives research lab at Beloeil, Que., to cost approximately \$600,000. Last year, Dow Chemical of Canada completed and put into use a \$500,000 laboratory in Sarnia; Du Pont built a modern research center at Kingston, Ont. Imperial Oil Ltd., Shawinigan Chemicals Ltd., and Union Carbide of Canada are similarly pushing research in the Dominion.

**Soft Spots:** Despite this activity, future Canadian research expansion may await alleviation of the current scarcity of scientists and technicians. Demand for graduate chemists is at an unprecedented high. The Engineering Institute of Canada believes neither immigration nor new graduates can fill immediate needs.

Some Canadians see another fly in the ointment: a need for tariffs to protect commercialization of new products. One vocal tariff advocate is H. Greville Smith, president of Cana-



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## RESEARCH

dian Industries Ltd. (Montreal). Smith says what the Canadian chemical industry needs is diversification; it concentrates too much on heavy-chemicals production. Diversification will be slow, he says, unless the tariffs are forthcoming. In turn, future diversification depends on research.

But with or without higher tariffs, the long-term trend is probably upward for Canadian research, most ex-

perienced observers agree. If recent forecasts (by the Royal Commission on Canada's economic prospects) come true, Canada will have a population of more than 26 million in 1980, and a real income two-thirds greater than at present.

Along with this growth is a surging desire for self-sufficiency as a nation—a desire that will depend in a large measure on research for its fulfillment.



## Reversing Foreign Aid

**Like his colleagues** all over the world, this Bangkok, Thailand, salesman for Parke, Davis is collecting soil samples for antibiotic research. More than 1,300 P,D representatives are enlisted in a new plan designed to systematically collect soil samples. The salesmen fill containers (supplied by the company) with soil, return them to P,D's main laboratories in Detroit.

The P,D soil-collection program owes its new emphasis to John Ehrlich, laboratory director in antibiotic research, and his associate, Arthur Hillegas. Under the old plan, soil collection was left to individuals not necessarily connected with the company. Collection is still voluntary—and without compensation.

Upon receipt, each container is numbered and tests begun to determine the number and types of or-

ganisms in the soil. (Most soil contains three classes of microscopic plants—moulds, bacteria, and actinomycetes—and from five to 20 species of each class.)

Not all drug companies feel the need for more emphasis on soil-sample procurement. Lederle Laboratories (Pearl River, N.Y.) is still wading through a backlog of thousands of samples collected in previous years.

Lederle is more concerned right now with developing better testing techniques, altering known strains of microorganisms by ultraviolet and other radiation.

Pfizer has utilized such soil collectors as a world-traveling student who sent back 30 samples a day. He even dug up a soil specimen from the bottom of the Tigris River in Iraq.

# Using Salt Efficiently

by INTERNATIONAL SALT COMPANY, INC.—America's largest producer of salt



## How to Find the Strength of Salt Brines—Accurately

In most of today's plants, the type of hydrometer called a Salometer can generally be used to measure the strength of salt brines most accurately. This device (similar in principle to the hydrometer which checks the condition of your car's battery) is convenient to use—and its scale permits fast calculations for a variety of plant needs. The Salometer scale reads from 0° in pure water to 100° in saturated brine, with each degree representing a percentage of fully saturated brine.

Using the Salometer with maximum accuracy, however, isn't just a matter of reading the scale. A number of simple precautions must also be taken to make sure the Salometer records correct brine strength. Here they are:



**1. Check the temperature** of the brine. Since most Salometers are calibrated for reading at 60° F., brine temperature should be kept at this level during testing. When other brine temperatures are encountered, it is necessary to use the following table of simple correction factors. These will help provide a completely accurate measurement of brine strength.

### APPROXIMATE CORRECTION IN SALOMETER DEGREES

Observed Salometer reading	Subtract per degree below 60° F.	Add per degree above 60° F.
0 to 10	0.049	0.060
11 to 20	0.064	0.082
21 to 30	0.077	0.094
31 to 40	0.087	0.103
41 to 50	0.095	0.112
51 to 60	0.102	0.118
61 to 70	0.107	0.123
71 to 80	0.112	0.128
81 to 90	0.116	0.131
91 to 100	0.120	0.134

For measuring cold brines, such as those used in meat-packing plants, special 38° F. Salometers may be used. Special temperature-correction factors are available when using this type of Salometer to test brines above or below 38° F.

**2. Brine should be tested** only in a straight-walled cylinder made of clear glass—set on a level surface. Any moisture that collects on the outside of the cylinder should be wiped off before testing procedures start.



**3. Salometer stem must be thoroughly dry**, clean, and free from grease or caked salt crystals. Also, the Salometer should not touch the sides of the cylinder when readings are taken. It should be read with the stem in a vertical position.

**4. Check new Salometers** by placing them first in clear water; reading should be 0° S. Then empty the cylinder, rinse with a saturated salt solution, and refill

**5. Correct reading technique.** Brine tends to rise along the sides of a glass cylinder, forming a concave surface known as a meniscus. For correct reading, the eye should be brought to a point level with the *bottom* of this meniscus. Errors of two or three degrees are possible if reading is taken at the point where the brine has risen along the sides of the cylinder.

**Special Salometers.** In the canning industry, where brine is used for quality grading, a different type of Salometer is often used. It's graduated on a scale where 100° S. represents brine containing 25% salt, instead of the normal 26.395%. Special hydrometers may also be used in the tanning or chemical industries. But the same procedures outlined here must always be followed when brine is to be tested—no matter what type of hydrometer a plant uses.

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If you'd like help on any problem concerning salt or brine—or further information on testing brine strength—contact your nearest International sales office.

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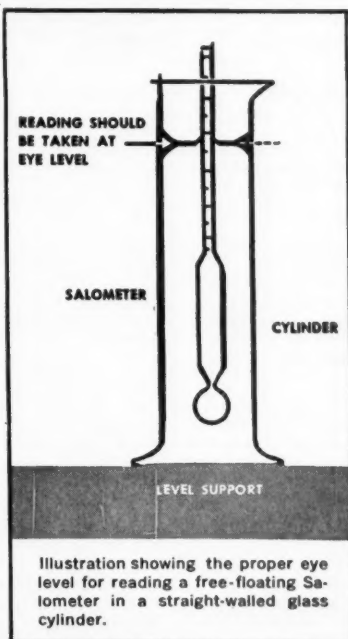


Illustration showing the proper eye level for reading a free-floating Salometer in a straight-walled glass cylinder.

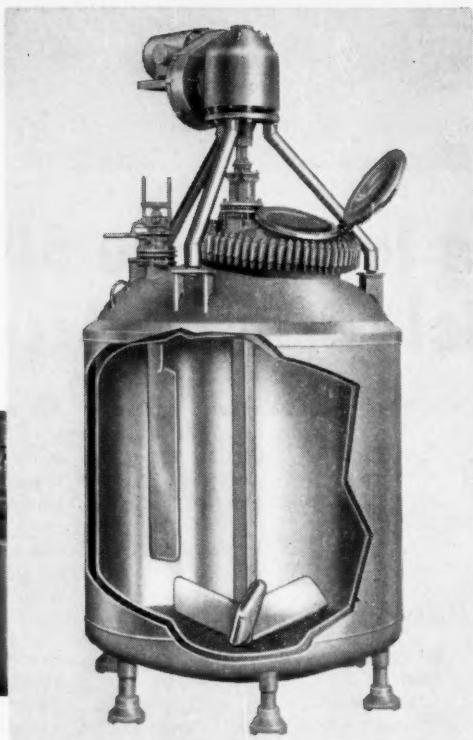
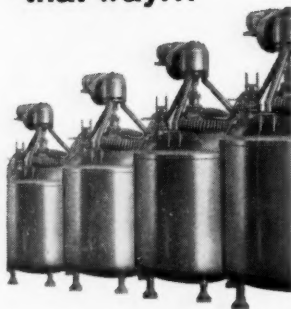
with fully saturated brine; reading should be 100° S. Both water and brine should be at 60° F.

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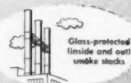
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## RESEARCH

### EXPANSION

- Atlas Powder Co. has broken ground for a new \$3-million technical center to be located next to the company's general offices in suburban Wilmington, Del. Scheduled for completion by the end of this year, it will house the Atlas Chemical Research and Product Development Depts.

- Carpenter Steel Co. (Reading, Pa.) is expanding its corrosion research laboratory to include studies of corrosion problems in the atomic energy and guided missile fields.

- Food Research Laboratories (Long Island City, N. Y.) has established a West Coast laboratory to supplement its main facilities in nutritional, toxicological and pharmacological investigations.

- American Potash & Chemical Corp. has just opened a \$200,000 addition to its Whittier, Calif., research laboratory.

- Neville Chemical Co., a producer of resins, other coal and petroleum by-products, will spend \$750,000 to double its Pittsburgh, Pa., research facilities.

- Stanford Research Institute (Menlo Park, Calif.) is expanding its radiation research facilities with the acquisition of a 1-mev. General Electric resonant-transformer electron-beam generator. SRI's radiation research is expected to cost more than \$1 million in 1957. Present equipment includes a 2-mev. Van de Graaf accelerator and a cobalt-60 source of gamma radiation.

- Radiation Applications Incorporated has opened its new industrial radiation center at Long Island City, N. Y. Housing a 1,350-curie source of cobalt-60, the center is for use by industry and government on both a service and contract basis.

### LITERATURE

- Climax Molybdenum Co. (New York) has just published a 15-page bulletin, "Properties of Heteropolymolybdates," covering the properties, uses, classification, nomenclature and preparation of heteropolymolybdates. A bibliography on heteropoly anions is also included.

- Available from Food Research Laboratories (Long Island City, N. Y.) is a booklet, "When, Why, How to Use an Independent Laboratory."



# ATLAS

## chem-memos

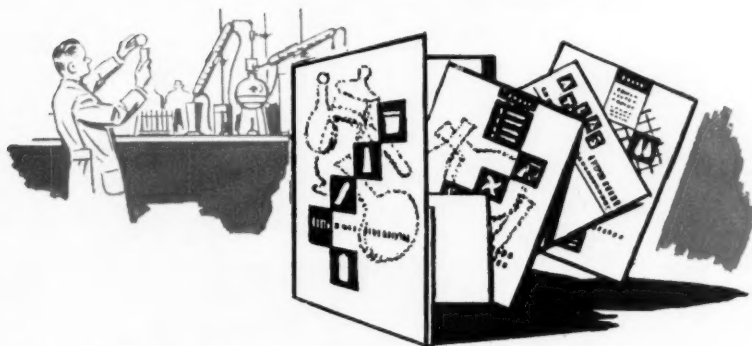
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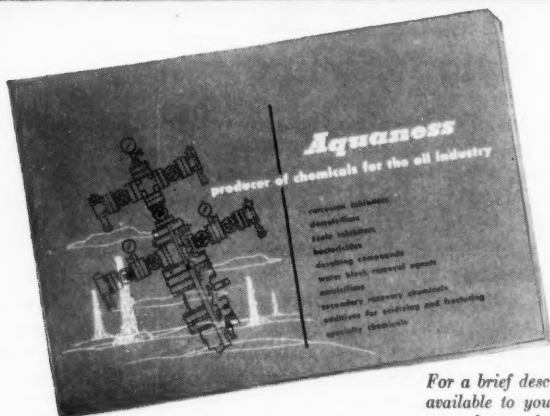
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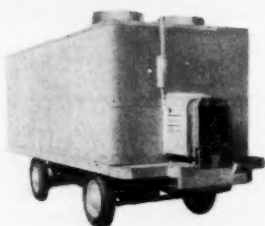
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## RESEARCH

- A newly published catalog by Volk Radiochemical Co. (Chicago) is said to contain the largest number of labeled compounds offered by a single source. Over 3,000 labeled compounds are described, including carbon-14, phosphorus-32, sulfur-35, deuterated and tritiated products.

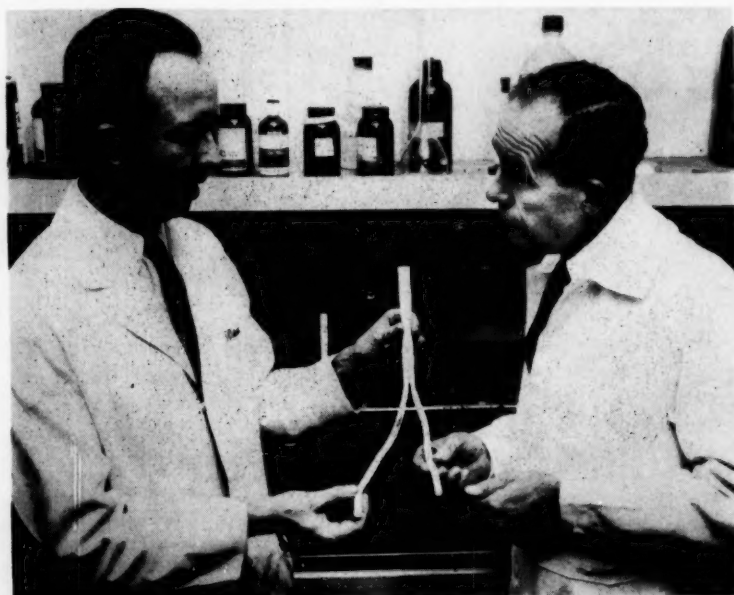
- The first issue of a new quarterly publication, "Ideas in Development," is now being distributed by Armour and Co.'s Chemical Division (Chicago). This issue contains articles on oleyl amines,  $\alpha$ -sulfoalkyl acids and ethochemicals.

- "Moly-Sulfide as a Filler" is the title of a new 4-page Climax Molybdenum Co. bulletin that describes the use of molybdenum disulfide as a filler in nylon, phenolic laminates, Teflon,

natural and synthetic rubber. Included: the preparation and properties of molybdenum disulfide-filled products, properties of the compound itself.

- The fifteenth—and final—volume of the Encyclopedia of Chemical Technology has just been issued by Interscience Publishers (New York). The 620-page book consists mostly of an index containing about 50,000 entries. Subscription price of the 15-volume work is \$375; it will be increased to \$400 on July 1, '57.

- Tetrahedron, an international journal of organic chemistry, plans to commence publication early in '57. It will carry papers by researchers from all parts of the world. Pergamon Press (London) will publish the journal.



## Newest Nylon Lifeline

The Y-shaped tube above—a synthetic substitute for a branched human aorta—is inspected and discussed by its developers, Dr. W. Sterling Edwards (left), assistant professor of surgery at the Medical College of Alabama (Birmingham), and James Tapp, head of the Chemstrand Corp. pioneering section which does fundamental research. Product of industrial research that's bearing humanitarian fruit, the synthetic

aorta is available to physicians without license charge.

Edwards and Tapp also developed the original nonkinking nylon aorta (CW, Feb. 19, '55, p. 68), which, however, was nonbranching. The new "aortic bifurcation graft," tubes of which are crimped and chemically treated, is being used to replace the human aorta at the point where it branches to carry blood to the legs.

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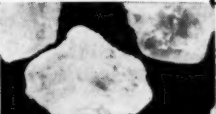
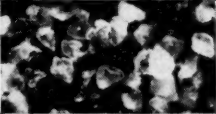
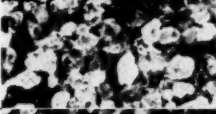
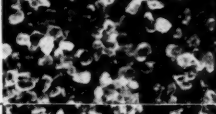
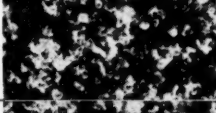
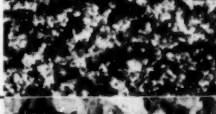

This checklist shows the many forms in which you can purchase PARADI (100% pure Hooker paradichlorobenzene).

Every one of the seven crystal sizes has its advantages, depending on how you plan to process or repackage it. All seven are shown here actual size.

To help square away your paradichlorobenzene requirements for this year, just route this page to the right people in your company. We've left space for their comments.

✓ PLEASE ROUTE TO:

- ☐ Purchasing
- ☐ Production
- ☐ Sales
- ☐ Research
- ☐ Return to Purchasing

SIZE AND DESCRIPTION:		COMMENTS:	CHECK HERE FOR:		
			Free 1-lb. sample	50-lb. trial drum (purchase)	Further information
<b>PEA No. 1</b> Repackage these big sparkling PARADI crystals just as they come from the drum.					
<b>PEA No. 2</b> A popular size for re-packaging in vaporizer cans.					
<b>RICE No. 1</b> Smallest crystals recommended for direct repackaging. Excellent for shaker-top cans.					
<b>RICE No. 2</b> Exceptionally free-flowing, easy packing, for fast refilling of power presses.					
<b>RICE No. 3</b> For foot-operated presses you need a finer crystal like this—free-flowing but small enough to pack and compress easily.					
<b>POWDERED</b> Save time in melting and molding with this super-fine fast-melting size.					
<b>GRANULATED</b> This size is used as an agricultural insecticide and herbicide, and as a chemical intermediate.					

SEE FOR YOURSELF the extra sales appeal you can get with dry, sparkling PARADI. The brilliant, snowy crystals sublime *completely*—without stain or residue. They make firm, clean blocks and pellets of exceptional whiteness. You can get them in fiber drums—25, 50, 100 or 200 lbs. net.

Send for samples, or order trial drums of the sizes that match your needs. And tell us how else we can serve you—with technical data, helpful processing and packaging hints (ask for Bulletin No. 454), shipping information.

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## RESEARCH

### PRODUCTS

**DDVP for Fly-Bait:** Dimethyl 2,2-dichlorovinyl phosphate, manufactured by Montrose Chemical Co. (Newark, N. J.), is now permitted by the Dept. of Agriculture for use in fly-baits and control of phorids in mushroom houses. Formerly, DDVP was authorized for experimental use only.

**Placidity Producer:** Abbott Laboratories (North Chicago, Ill.) is out with a potent new nonbarbiturate drug that's reportedly useful for producing effects varying from tranquilization through sedation to hypnosis. Tradenamed Placidyl (generic name: ethchlorvynol), it's said to cause few side effects.

**High-Purity Standards:** Newly available American Petroleum Institute standard samples of organic chemical compounds include: pyridine, pyrrole, pyrrolidine, 5-methyl-trans-2-hexene, ethylenecyclopentane, ethylenecyclohexane. Price of each: \$50/5 ml. They may be ordered from Carnegie Institute of Technology, Petroleum Research Laboratory, Pittsburgh 13, Pa., attention of Frederick D. Rossini.

**Heat-Resistant Greases:** A new series of greases developed in Britain for high-temperature operation reportedly give efficient lubrication at working pressures of 100,000 psi. in machinery operating continuously at temperatures up to 450 F. Based on molybdenum disulfide and a modified form of bentonite clay, the newcomers are claimed to be resistant to high-pressure steam. Manufacturers: Rocol Ltd. (Swillington, near Leeds, Yorkshire, England).

**Intermediate Entry:** A new intermediate, isoamylamine (isomerically pure), is available in pilot-plant quantities from Freeman Industries (Tuckahoe, N.Y.).

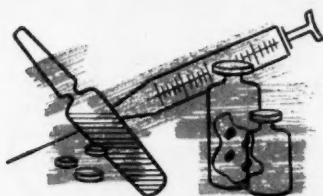
**Derivatives:** Chemicals Procurement Co. (New York) now offers the desamino derivatives and the butyric-acid analogues of 3,5-diiodo-L-thyronine; 3,3',5-triiodo-L-thyronine, and 3,3',5,5'-tetraiodo-L-thyronine. Also available is the potent thyroxine inhibitor, butyl-3,5-diiodo-4-hydroxy benzoate.

# Which New CO<sub>2</sub> Application Will Help You Most?

"CO<sub>2</sub> applications are unlimited"... a broad statement, but literally true. New ways in which this most versatile of all gases is improving products, cutting costs and saving time and labor are being developed almost daily. Some of the applications discussed here will be of direct, primary interest to you. Other uses, while perhaps not in your immediate specialty, may well be *adaptable* to your field. Check the box by each application on which you'd like detailed, technical data and mail to:

The Liquid Carbonic Corporation • CO<sub>2</sub> Division  
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Your inquiry will receive prompt, professional attention from the chemical applications staff of the world's largest producer of CO<sub>2</sub>.

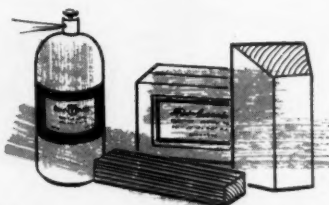


☐ ► **Economical, Efficient "Freeze-Drying"**—Freeze-drying is used to dehydrate heat sensitive substances at low temperatures. In the processing of blood plasma and the manufacture of penicillin, streptomycin and other pharmaceuticals, dry ice or liquid CO<sub>2</sub> is used to freeze the item being dried. Also, during the drying stage, dry ice is used to condense the moisture as it is sublimed under vacuum. Capable of quickly attaining and maintaining the extreme low temperatures required, CO<sub>2</sub> has the added advantage of requiring only a small capital outlay.

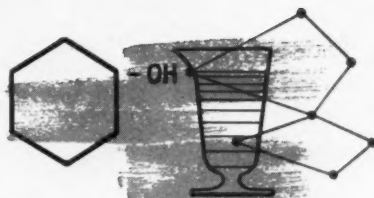


☐ ► **Precipitation of Carbonates**—Carbon dioxide in its gaseous form is used to

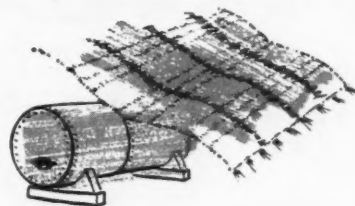
precipitate carbonates from water solutions. Ammonium bicarbonate and lead carbonate are examples. Bakeries and plastics manufacturers are among the many users of ammonium bicarbonate.



☐ ► **Simplifies Pulverizing of Materials With Low Melting Point**—Many substances tend to melt or smear because of the heat generated in a milling process. DDT and vegetable fat flakes which are waxy and Teflon resin which is very tough and elastic are examples. In the low temperature pulverizing process the ingredient is mixed with crushed dry ice or low pressure carbon dioxide liquid is injected directly into the ingredient. These methods effectively inhibit the melting or smearing, prevents plugging and reduces horse power requirements. Gaseous carbon dioxide is also used to form an atmospheric "blanket" to effectively prevent fire during the grinding of flammable materials. An example of this application is the grinding of phosphorus pentasulphide and flammable resin materials.



☐ ► **Fireproof "Blanket" For Stored Phenol**—Phenol is a toxic, corrosive, flammable compound and is stored in an inert atmosphere under slight pressure to reduce vaporization, prevent oxidation and at the same time provide a non-flammable atmosphere. Carbon dioxide is also used as a pressure medium in transferring liquid phenol.



☐ ► **Effective Inerting Agent**—There are many times when an inert atmosphere is needed to prevent fire or explosion. Before welding a tank that has been used for the storage of flammable liquid, CO<sub>2</sub> is used to inert the atmosphere in the tank so that welding can be done with no danger of explosion. CO<sub>2</sub>, acting as an effective atmospheric "blanket," also prevents oxidation and "skinning" of paints and oils.

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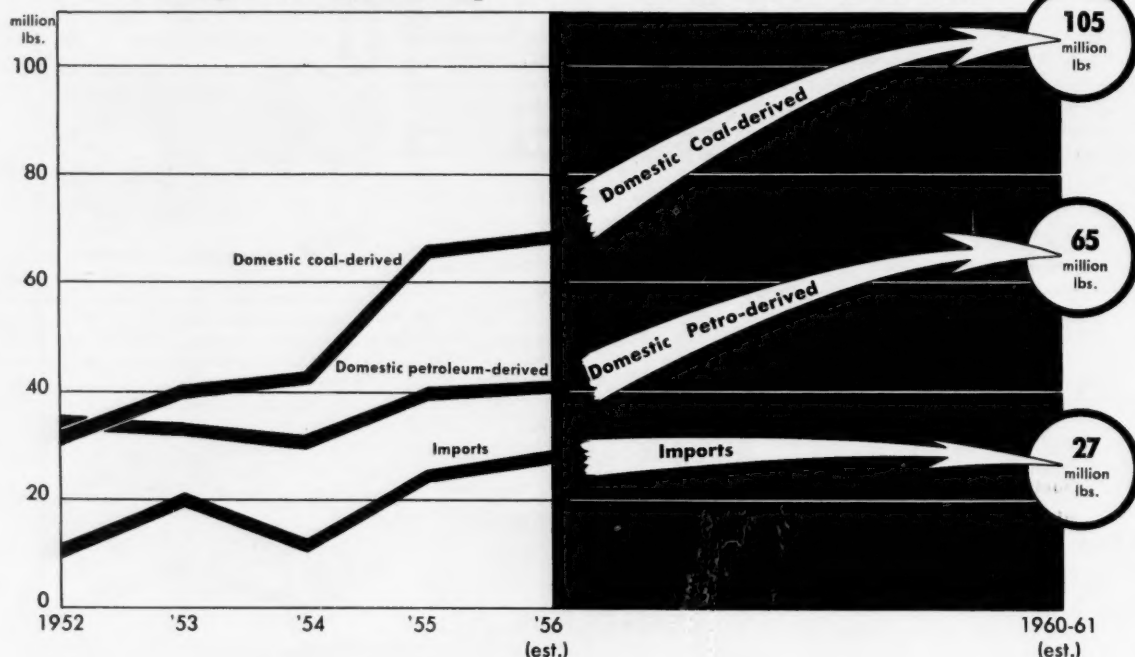
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# MARKETS

**Cresols, cresylic acids supply has grown steadily ...**

**... By 1960-61, it should reach these levels.**



## Ahead: New Zoom in Cresylics Supply

Few expansion announcements have stirred as much comment—and speculation—as has Pitt-Consol Chemical's recently revealed plans for the manufacture of cresols and cresylic acids. Why? If the hopes of the firm—a comparative newcomer in cresylics—pan out, its installation that's just in production, plus the one in planning, will, within four or five years, be turning out more than half the amount U.S. producers were making before Pitt-Consol entered the field a year or so ago—some 60 million lbs./year.

The company (a wholly owned subsidiary of Pittsburgh Consolidation Coal Co.) plunged into the cresols and cresylics business in late '55, when it purchased an old plant in Newark, N.J., from Reilly Tar & Chemical. The company then plunked down \$3.5 million for a new refinery that's now shifting into high gear after some minor startup difficulties. It's said to be the world's first completely continuous processing plant for cresylic

acids, cresols and phenols.

There's no official word on actual capacity of the new Newark unit (originally slated for full production in January of this year). Fairly firm estimates, however, indicate that Pitt-Consol's cresol-phenol capability there will be tripled, soon hit some 20 million lbs./year.

The new refinery uses as its raw materials petroleum refinery liquids that were formerly disposed of as waste. Right now, Pitt-Consol is concentrating on producing cresylic acids for plastics and general industrial chemical uses; too, it's upgrading some cresylic refinery products into phenolic resins and molding powder.

Future Newark plans also call for processing of products derived from the company's LTC—low-temperature coal-carbonization—units; such production will be a supplementary source of raw materials to those now coming from the petroleum industry.

**Outlook for LTC:** It's Pitt-Consol's blueprint for low-temperature carbon-

ization that has most cresol and cresylic market researchers sizing up the likely impact on domestic production and imports. P-CC's new plant at Cresap, W. Va. (*CW*, Aug. 18, '56, p. 17), though slated to produce the same range of chemicals as the Newark installation, will use low-boiling coal liquids from carbonization as feed material. Estimated cresylics capacity: 40 million lbs./year (*CW*, Oct. 27, '56, p. 126).

This venture is one result of a 10-year, \$14-million Pittsburgh Consolidation investigation into near- and far-term possibilities of coal processing. The company anticipates that the type of processing it will use at Cresap will yield some 50-60 million gal. of refined liquids that must be marketed at a price profitable enough to justify its \$30-million investment in plant and working capital.

Of that whopping output, less than 10% will be suitable enough to buck for cresol-cresylic outlets existing four or five years hence.

# "Many customers report our new 'shotted' urea fits their needs perfectly"

"This free-flowing form of Du Pont Urea has permitted quite a number of users in my area to simplify and speed up processing." This report from Du Pont Polychemicals representative Bob Harbour is typical of comments received during recent months.

An evaluation of Du Pont Shotted Urea in your operations may prove to be the answer to one of your processing problems. Or if you require urea in its crystalline form, remember that Du Pont Crystal Urea still sets the standard for purity for *all* industrial chemicals . . . no other chemical product sold in tonnage lots has higher purity.

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**BOB HARBOUR** is sales representative for the Du Pont Polychemicals Dept. in northeastern Ohio, western Pennsylvania and western New York. Bob, a graduate chemical engineer from Ohio

State, has had extensive experience in serving the chemical process industries. Like his fellow salesmen, Bob is equipped to work closely with customers in determining individual chemical requirements.

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**Cresols, Cresylic Acids End-Use Pattern (est.)**

(million pounds)

	1957	1960-61
Tricresyl phosphate	35	47
Phenolic resins	37	55
Wire enamel solvent	9	13
Ore flotation reagents	9	11
Metal cleaners	9	12
Disinfectants	10	11
Solvent refining	5	7
Other	21	30

But as Vice-President Joseph Purs-glove, Jr., explained recently, his company is "currently working on commercial arrangements for the disposal, through regular marketing channels, of the intermediate materials consisting of 35-40% of Cresap's total output." The materials will be used in "highly effective" wood preservatives, road tar components, and as feed stock for a contemplated 50-60-million-lbs./year carbon black plant.

**Convention, Not Innovation:** Such low-temperature distillation processes for coal (and lignite), however, are still in the future. For some time, markets for cresols and cresylic acids will continue to be dominated by more conventional sources. Slated to retain top slot: high-temperature U.S. coke ovens. Right now, for example, domestic coal-tar-derived materials are pouring out at a clip of nearly 69 million lbs./year—just about double the total amount that's coming from the U.S. petroleum industry and from imports (see chart, p. 98).

Barrett Division (Allied Chemical) undeniably leads the field of coal cresols and cresylics producers. (It will probably make in excess of 20 million lbs. this year.) Koppers and U.S. Steel run a close second and third, with respective '57 outputs estimated at 18 and 15 million lbs. Next: Pittsburgh Coke & Chemical, Inland Steel, Interlake Iron.

Imports, of course, have also contributed heavily to the coal-derived total. From 25 to 50% of American demand for cresols and cresylics is traditionally supplied by such foreign material, bulk of which comes from England. Lesser amounts flow in from Germany, Japan, other countries. The percentage range of foreign-filled

market requirements will likely remain unchanged over the next few years, though demand for specific cresol fractions, notably that of the meta-para isomer combination, is expected to increase substantially. It's conceded here, too, that if the duty on meta-para were lowered, more would be made available to occasionally pinched users.

Quantity of American duty-free (ADF) imports have swung, pendulum like, in almost direct ratio to U.S. producers' ability to supply consumers. At times, even with the incoming amounts, there have been shortages. Such instances occurred during and immediately after World War II, during the Korean emergency and, albeit less acutely, during the past year.

Total imports during '56, for example, are expected to check out at more than 28.5 million lbs., well within hailing distance of the '50-'51 Korean period's 30-35-million-lbs./year range, and just about two and half times the shipments received in the U.S. during '54.

How are imports likely to fare in the foreseeable future? Chances are that, as European requirements step up and U.S.-produced cresols and cresylic acids increase, amounts of foreign material available here will ease off slightly, settle at a fairly constant rate of 25-30 million lbs./year.

**Petro Steps In:** Wartime needs of consumers gave impetus to production and marketing of petroleum-derived cresylics. And while these initially augmented scarce coal-tar-spawned domestic and imported supplies, output and use of oil-derived material has steadily gained over the years.

There were periods when production dipped. In the generally slow sales year '54, it dropped to about 31 million lbs. But by and large, business has bounced along satisfactorily. This year, for instance, U.S. sellers of petroleum-derived cresylic acid may channel approximately 48 million lbs. into a fairly active market. (Among major sellers of refined material: Shell, Pitt-Consol, Merichem, Productol, Oronite, Magnolia.)

At one time, coal-tar materials had pretty much cornered one major cresols-cresylic outlet, phenolic resins, chiefly because acids recovered from cracked petroleum oils contained greater amounts of objectionable impurities. These inhibited or interfered with resin-forming reactions. But petroleum outfits gradually hurdled the obstacles to greater sales, began to distill and treat their products to meet cresylic resin makers' specifications. Today, phenolic resins are consuming some 37 million lbs./year, with little favoritism being shown for either type. And there's no consumption letdown in sight. By the end of the decade, such use (see end-use pattern) may hit about 55 million lbs./year.

Tricresyl phosphate production has long been a "big time" consumer of both coke- and oil-derived cresylic (specifications for this outlet aren't in some cases, as critical as those for resins.)

Much of the tricresyl phosphate made in this country winds up in plasticizers: one good estimate: 10-12 million lbs./year, mostly for use with polyvinyl chloride and polystyrene. Total tricresyl production hasn't noticeably sagged in the past few years, despite increasing competition from some phthalate plasticizers. Note this three-year progression: in '54, production totaled about 24 million lbs.; in '55, more than 28 million; last year, close to 30 million.

Also contributing to the cresylic derivative consumption is the healthy use in hydraulic fluids, and as an antileak fouling additive in gasoline. Shell, one of the top petroleum cresol-cresylic producers, splashed out with its TCP-tagged meta-para cresol-derived additive a few years ago (*CW*, June 20, '53, p. 68), and since then has carved out a tidy outlet. The gas-tank market this year will



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THE DOW CHEMICAL COMPANY,  
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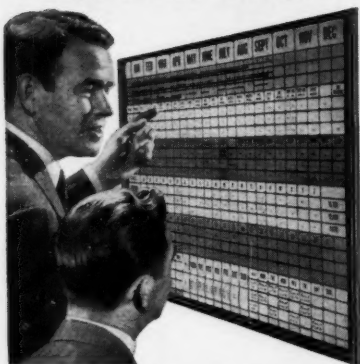
☐ adhesives ☐ cutting oils ☐ building materials

☐ petroleum ☐ other (specify) \_\_\_\_\_

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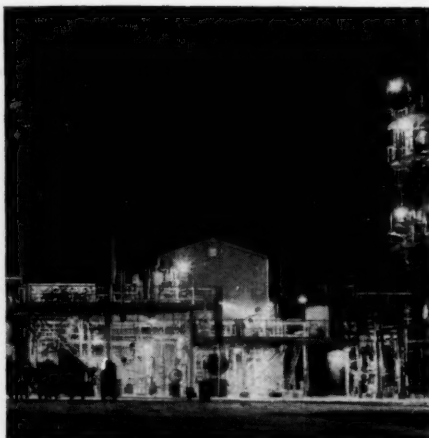
## MARKETS

take perhaps 5 million lbs. of cresol, considerably below the early publicity-ballooned estimates that ranged as high as 40-50 million lbs./year.

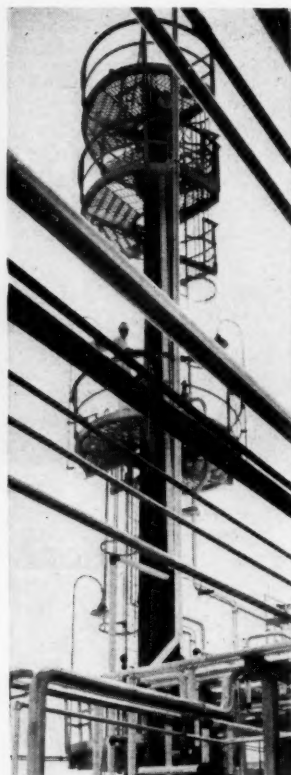
There is, of course, an overlapping of coal-tar and petroleum cresylic markets, and at times the competition is compounded by imports. A good measure of the scrambling is often reflected in selling prices on the latter. Imports usually follow domestic schedules, both up and down, but peak somewhat above the highs and

drop further than the lows set for U.S. material.

It's arguable, of course, whether or not the near-future stepup in cresols' and cresylic acids' over-all supply—underscored in expansions by Pitt-Consol and other producers—will stabilize the price fluctuations that often upset the market; but this much is apparent to most market analysts: consumers, for some time to come, will have few worries concerning availability.



Lights and towers  
of Celanese's new poly-  
ethylene plant—now  
getting the final  
touches—signal the ...



## Low-Pressure Debut in Texas

One of the first low-pressure polyethylene units to go onstream will be Celanese's Houston, Tex., installation. If all goes well, the firm's new 40-million-lbs./year polyolefin resins plant—one of many scheduled to debut this year (*CW*, Jan. 26, p. 82)—will be producing before the end of month.

Small quantities of the Celanese resin (tradenamed Fortiflex and produced under license from Phillips

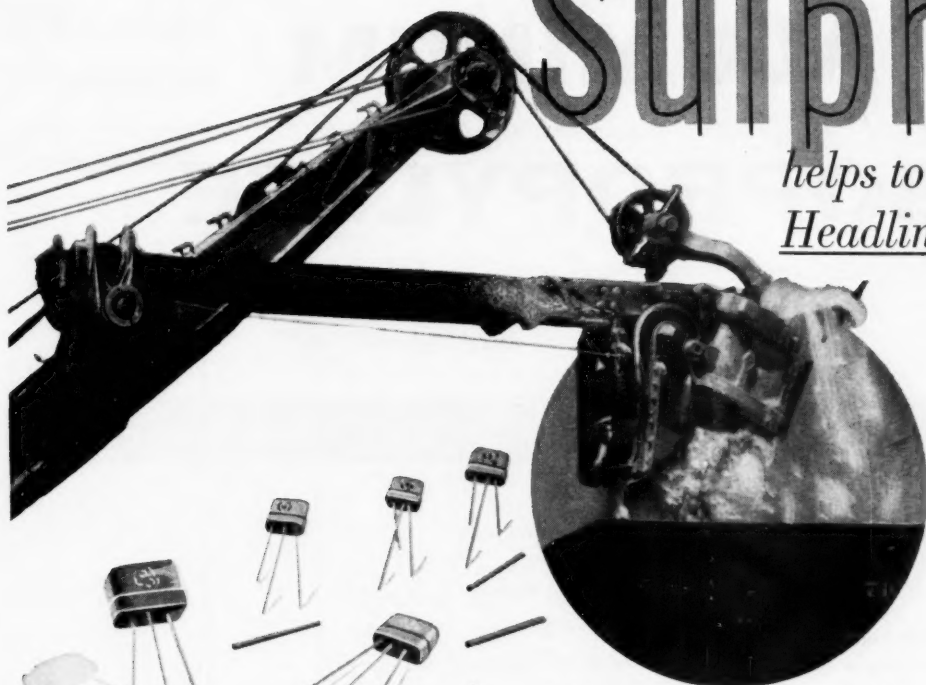
Petroleum) have already been made at a semiworks unit.

U. S. low-pressure polyethylene capacity is expected to total some 380 million lbs./year by late '57 or early '58; by 1960, total capacity may be close to 600 million lbs./year.

This tally compares with 850-900 million lbs./year of high-pressure polyethylene capacity that may be available before the end of '58.

# Sulphur

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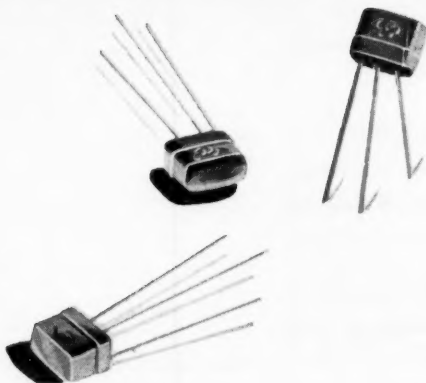
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Appearance	White Solid
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# Market Newsletter

CHEMICAL WEEK  
February 16, 1957

**Copper and copper chemical price changes** continue to highlight the market news this week. Custom smelters, for instance, have chipped their prices down to 33¢/lb., a full cent under last week's 34¢ tag. (The latter, in turn, was the end result of two cuts two weeks ago.)

The latest move again puts prices quoted by U.S. primary producers above those of smelters—a situation they vacated last week by dropping prices to meet the smelters' 34¢/lb. schedule. Most trade followers now expect another slash by producers, but few will predict that 33¢/lb. will be the bottom price in the current round of tag-altering. More likely near-future peg for copper: 30¢/lb. on both producers' and smelters' metal.

**Copper chemical prices also showed declines** as predicted last week (*CW Market Newsletter, Feb. 9*). Down  $\frac{3}{4}$ -1¢/lb. in carload quantities are copper carbonate, hydrate, black oxide, and regular crystal, dry crystal and anhydrous chloride, as well as cupric chloride. Reductions had been posted earlier on tribasic copper sulfate, sulfate crystals, and monohydrated sulfate.

Current c.l. prices include: 34 $\frac{3}{4}$ ¢/lb. on 55% copper carbonate, 51 $\frac{1}{2}$ ¢ on the hydrate, black oxide at 49 $\frac{1}{2}$ ¢/lb., and regular copper chloride crystals at 30¢/lb.

•  
**On the other hand, bromine will cost more.** Spot prices for purified basic material are going up a cent per pound immediately; contract customers will feel the pinch April 1. Behind the hike: "generally increased manufacturing costs."

New c.l. quote on pure bromine packed in cases is 33¢/lb.; in drums, 32¢/lb.

One anticipated result of the bromine increase: higher prices on such important derivatives as ammonium, calcium, potassium and sodium bromide. These were advanced in price last June. The reason then? Higher manufacturing costs.

New schedules on the bromides—up 2-5¢/lb.—are effective immediately to spot buyers, April 1 on contract.

•  
**How did the U.S. rayon and acetate industry do** in the year just ended? On a total production basis, reports the latest issue of *Textile Organon*, output in '56 slipped about 9% compared with '55. Shipments of rayon and acetate by domestic producers dropped even more.

Total production last year came to 1,148 million lbs. vs. '55's 1,261 million. Shipments declined 135 million lbs. (some 10.5%) to a total of 1,127 million in '56.

## Market Newsletter

(Continued)

This drop in rayon and acetate manufacture, however, was somewhat offset by increased production of textile glass-fibers and the noncellulosic fibers. The glass-fiber shot up 28% over the previous record '55 output—to 97 million lbs. The noncellulosics rose 5.5% to a total of 400 million.

These increases held the over-all U.S. man-made fiber production figure for '56 to but a 4% decrease from '55's all-time record of 1,716 million lbs.

**Rubber traders may be crowing this week.** Last fall, many had opposed any change in the government's natural rubber stockpile rotation policy to ease what rubber fabricators insisted would soon be a shortage engendered by the blocking of the Suez Canal.

Late last week, revelation of the results of a study on shipping delays (made for the government by an importers group) seems to bolster the traders' earlier more optimistic view. It showed a "net weighted average delay" of only four days for 16 ships bringing Asian rubber into the New York harbor during December. These ships, which rounded the Cape of Good Hope, landed 98% of the Asian rubber that arrived in New York during the month.

Transit time ran an extra 10-14 days for four ships that called on Mediterranean ports after rounding the cape, but three checked in a six-day gain (over trips via the previous Suez route), by eliminating their Ceylonese and Indian ports of call.

**Coke and coal-chemical marketers were further apprised** on the future of cresols and cresylic acids (*see p. 98*) when James Carpenter of the Business & Defense Services Administration spoke before the American Coke and Coal Chemicals Institute in Chicago last week.

One conclusion cited: the future market growth for cresols and cresylics "seems certain" because of the versatility of the products. Too, he indicated that in the foreseeable future consumers should have little concern about supplies. Also cited: the possibility that oil shale may one day become an important source of tar acids.

### SELECTED PRICE CHANGES, Week Ending Feb. 11, 1957

UP

	Change	New Price
Bromine, purif., cs., c.l., t.l., dlvd., E. of Rockies .....	\$0.01	\$0.33
Bromides:		
Ammonium, l.c.l. ....	0.02	0.45
Calcium, 100-lb. drms. ....	0.05	0.97
Potassium, bbls., kgs. ....	0.02	0.38
Sodium, c.l. ....	0.02	0.38
Casein, Argentine, acid-prec., grd., c.l., duty-pd. ....	0.0075	0.2375
Tin, metal .....	0.0025	1.0375

All prices per pound unless quantity is stated.

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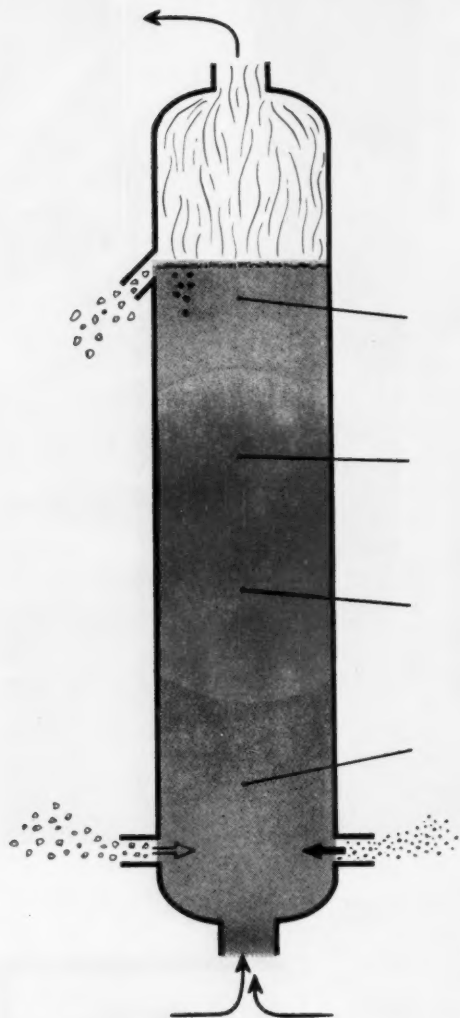
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# PRODUCTION

## Pyzel fluid-bed cement process . . .



**Solid-solid reaction permits new precision in control**

- 1** Uniform size and quality of clinker facilitates product grinding, reduces power requirements.
- 2** Cement reaction goes to completion, produces maximum of high-strength ingredient and minimum of free lime in product.
- 3** Fluid-bed temperature remains constant, permits precise, automatic control of cement reaction.
- 4** Instantaneous reaction of raw materials prevents free-alkali-induced slagging and formation of troublesome dust.

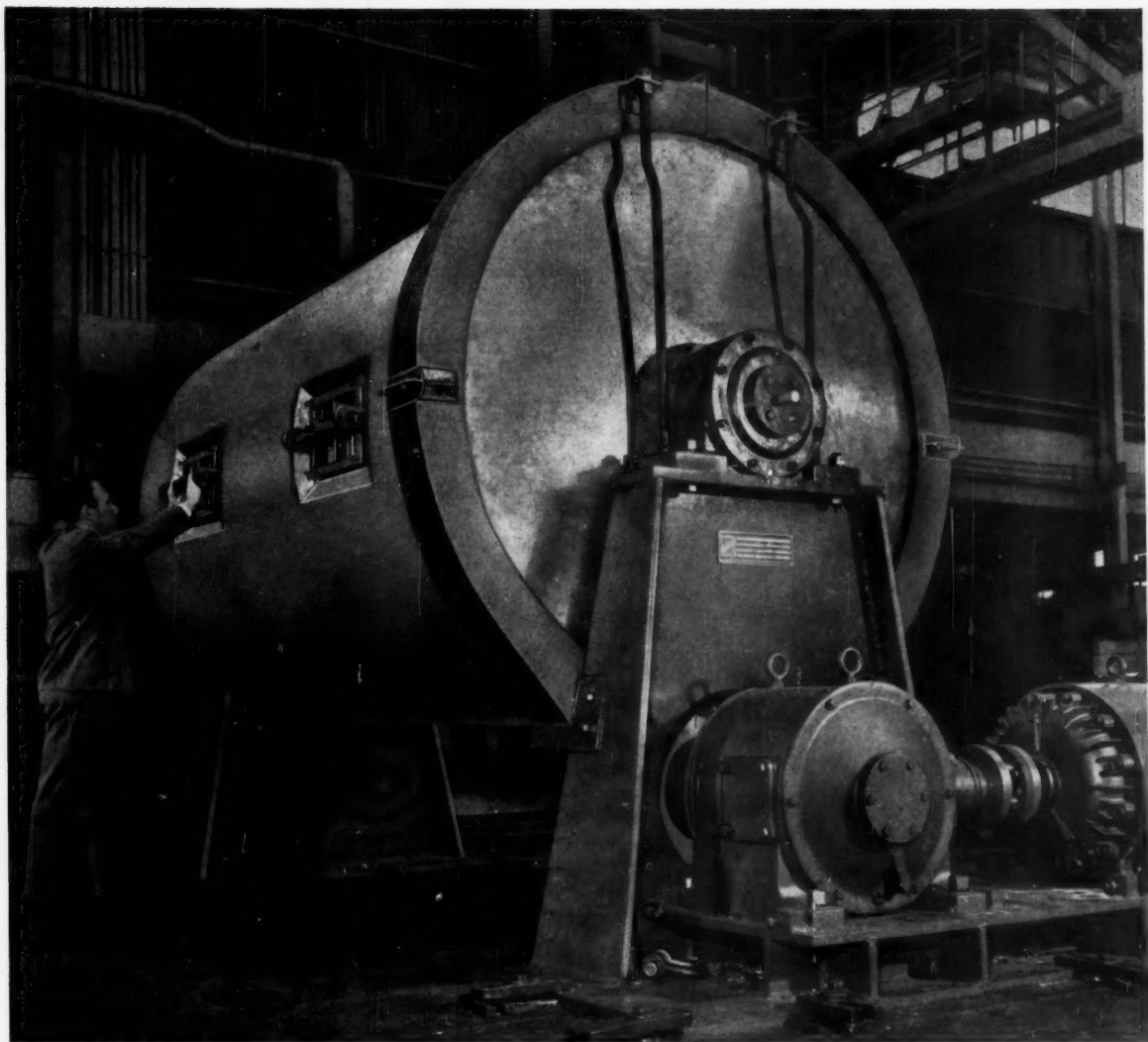
## Clinker Grows in Fluid Bed

Ever since petroleum producers perfected fluid-bed processing techniques for catalytic cracking, chemical engineers have sought to adapt other types of chemical reactions to fluidization. Newest application of the fluid bed is a cement manufacturing process—the Pyzel process—currently being developed (*CW Technology Newsletter*, Jan. 12) by The Fuller Co. (Catsauqua, Pa.), a subsidiary of General American Transportation Corp. Fuller has already completed preliminary testing of the process, is now readying a second, larger (though still subcommercial size) re-

actor to further investigate operating economies.

Summing up progress to date, Fuller's G. K. Engelhart reports that development is about halfway to its goal. Operation in the initial pilot unit (a small, 3-ft.-diameter, 25-ft.-high reactor) produced high-quality cement clinker, but was too small-scale to permit accurate analysis of operating costs, efficiencies. Says Engelhart: "We've crossed the chemical engineering phase, still have to pass the mechanical stage."

**Solids React:** Though fluid cat-cracking has become standard operation in petroleum processing,



## Bigger process equipment helps fight the profit squeeze

The economic squeeze play, which finds many producers caught between rising costs and shorter profit margins, is likely to continue through 1957. In the process industries, the gap can often be widened by increasing productivity per machine hour. Dravo large scale or special purpose process equipment is ideally suited to this job.

The king size ball mill shown above is a case in point. Designed to meet specific grinding and batch size requirements, it is constructed of stainless steel. All the internal welds are

ground flush and the interior polished to a smooth finish. Internal corners are provided with fillets to facilitate cleaning between batches. This large ball mill is helping the owner to step up production rate.

This type of equipment has helped many processors lick production problems by reducing labor cost. And frequently, by bringing design into complete harmony with process requirements, special purpose equipment can achieve astonishing cost reductions.

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fluid-bed processes in which the solids take part in the reaction present some unfamiliar problems. The composition and size of the particles in the bed change continuously and, unless the effects of such changes are controlled, may seriously impair the fluidizing conditions.

The Pyzel process is unique in that it is the only fluidized solid-solid re-

action\*. Here's how it works:

Powdered raw material (typical feed used in conventional cement kilns) is fed in at the bottom of the reactor into a fluidized bed of coarse clinker particles. Fuel (oil is used in the pilot plant, but gas and powdered coal are

\*Other noncatalytic fluid-bed processes, such as chlorination of titanium ore to titanium tetrachloride (*CW*, March 19, '55, p. 84) and Dorr-Oliver's lime-burning and ore-roasting methods, are reactions of solids with gas.

also suitable) is introduced into the bed, burns with the fluidizing air to produce the cement reaction temperature. The powdered feed reacts almost instantaneously to form clinker product. The company is reluctant to disclose further details of the operation at this time.

**Cautious Scale-Up:** Though the Pyzel process has already shown great promise, Fuller is proceeding with caution. Product from the first test reactor proved that the fluid bed could turn out cement with no alkali, very low free lime and apparently with easy grindability compared with the kiln clinker. The last characteristic is especially important inasmuch as the greatest part of the power used in cement making goes into the grinding of feed materials and product. And since the fluid-bed product is of uniform size and hardness, says Pyzel, it may reduce grinding power requirements to  $\frac{1}{2}$ - $\frac{3}{4}$  of that needed in conventional plants today.

The abuilding second pilot unit is expected to determine optimum fuel ratios, capital investment and operating costs that will be characteristic of large-scale installations. Pyzel estimates that the fluidized reactor will operate in the neighborhood of 0.6-0.7 million Btu./barrel of cement—in line with the most efficient modern kilns (0.8 million Btu./barrel), considerably better than the industry average of 1.3 million Btu./barrel.

Before it takes the final jump into a commercial production facility, the process will be shaken down in a semi-commercial plant. Fuller has already completed the engineering of this third development unit, but probably won't schedule it for construction and operation until results from the second pilot reactor are in.

**What's Ahead:** Despite its promising early showing, the Pyzel process is still a long way from its goal. As numerous processors have learned before (some to their sorrow), fluid-bed reactions can be formidable processes to engineer (see p.112). And even if, as Fuller claims, the chemical engineering problems have been licked, the mechanical scale-up job that lies ahead may be tougher than expected.

But if the process lives up to the company's high hopes, it will likely become a tough competitor for large 300- to 400-ft.-long kilns to reckon with.

## Old Idea Paved the Way

**Inventor Robert Pyzel\*** first hit on the idea of making cement clinker in a fluid bed several years ago, rejected it as unworkable. His interest was revived, however, when a double-check of the hastily discarded idea led him to suspect that the popularly accepted concept of cement clinker formation is based on some self-contradictory theories.

By investigating existing kiln processes and examining obscure theories of the clinker-forming reaction, Pyzel developed a slightly different concept of how the materials combined into cement.

Pyzel has applied for several patents, says use of a recycle of seed clinker described in one (2,776,132) that issued recently is only one of several keys to the process.

Pyzel's next task was to prove out his revised theory on a pilot scale. But the process couldn't be operated in the lab, since it requires large-size equipment with a fluid bed of at least 3-ft. diameter. This problem was solved when the Fuller Co. agreed to build and operate a pilot installation, acquired worldwide rights to the process under an exclusive licensing arrangement.

**Kiln vs. Fluid-Bed:** The cement clinker reaction, says Pyzel, proceeds in the fluid bed in much the same way as it does in conventional kilns. Calcium carbonate is burned to the oxide, reacts with silica, alumina and iron oxide to form tetracalcium aluminoferrite ( $4\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{Fe}_2\text{O}_3$ ), tricalcium aluminate ( $3\text{CaO} \cdot \text{Al}_2\text{O}_3$ ), dicalcium silicate ( $2\text{CaO} \cdot \text{SiO}_2$ ), and tricalcium silicate ( $3\text{CaO} \cdot \text{SiO}_2$ ).

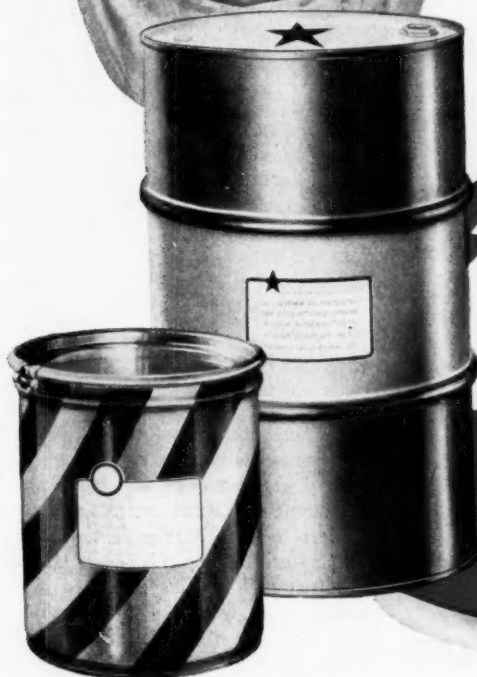
Kilns are generally difficult to operate at exacting reaction conditions, claims Pyzel; reaction of raw materials is incomplete. This, in turn, leaves varying small amounts of free lime in the product. The fluid-bed process, on the other hand, is inherently a precision operation, he says, capable of being controlled to the same degree as distillation and other chemical unit operations.

The fluidized clinkering reaction goes to completion, turns out a uniform product regardless of normal variations in feed materials. What's more, Pyzel adds, free alkalis ( $\text{Na}_2\text{O}$ ,  $\text{K}_2\text{O}$ )—the troublesome glass-formers that are responsible for slagging in kilns—are readily and completely removed in exhaust combustion gases from the bed. The combination of these advantages, he feels, would enable the fluidized reactor to handle raw materials that are too impure for feeding to conventional kilns.

\* Now an independent consultant, Pyzel has 30-years experience in process development in the refining field, with M. W. Kellogg from '41-47, earlier at Universal Oil Products where he headed process development for a number of years.



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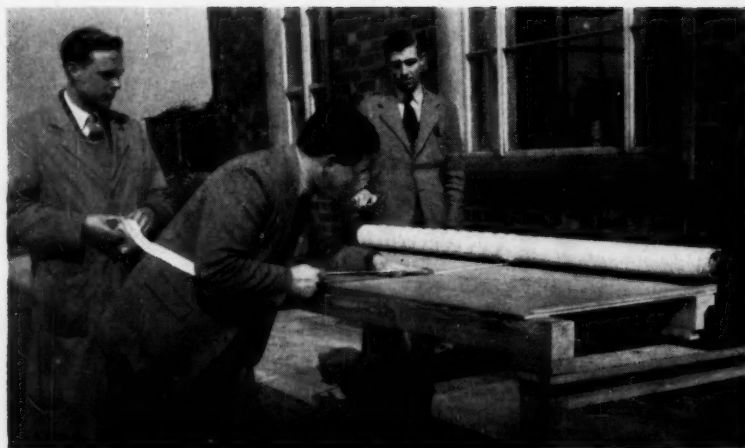
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## Bypassing Recovery Snags

Although phthalic anhydride producers have employed fluid-bed reactors for several years in the catalytic oxidation of naphthalene and *o*-xylene, they're still looking for ways to get around some of the tricky process stumbling blocks. H. L. Riley of United Coke and Chemicals Co. Ltd. (Orgreave, England) recently reported\* that the company's Rotherwood Laboratories has tried several processing tricks—two of which have made significant improvements in catalyst

\*Riley described processing improvements in a paper delivered before the Chemical Engineering Group of the Society of Chemical Industry. In the paper, he took issue with *CW's* comments (*Technology Newsletter*, Feb. 11, '56), stated that conclusions were based on incomplete information. However, problems cited elsewhere in the report iterated *CW's* contention that fluid-bed processing is not a simple technique to master.

recovery and product condensation.

Unlike fluid cat-crackers, which employ cyclones to recover a relatively inexpensive catalyst, phthalic anhydride reactors require equipment capable of recovering all of their expensive—and toxic—vanadium pentoxide catalyst.

Porous ceramic filters do the job, reports Riley, but leave much to be desired in the way of operating efficiency. Ceramic that's thick enough to withstand severe mechanical and thermal shock introduces a relatively high pressure drop. Porous stainless steel filters cause less pressure drop, but run up the cost of the recovery installation. And both types of rigid porous filters tend to become clogged

with fine catalyst dust, necessitating frequent chemical cleaning or total replacement.

To get around these problems—particularly the clogging of filter units—United Coke turned to glass-fiber filters. After several trials with various combinations of glass cloth and glass-fiber mat, it came up with an efficient design now used at the company's Orgreave Works phthalic plant.

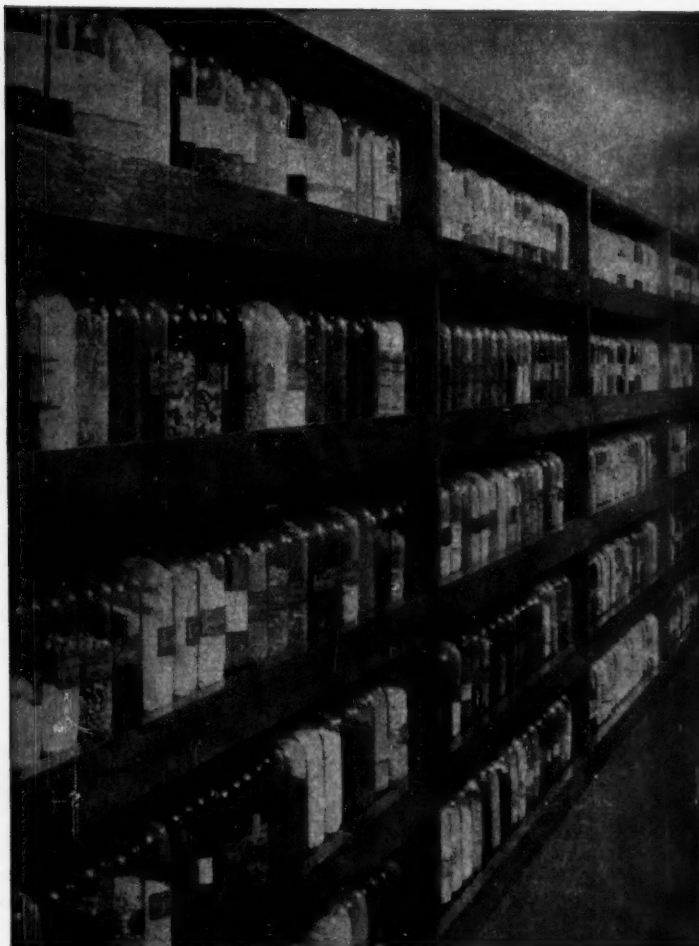
Support for the fiber-glass filter is a perforated steel cylinder closed at the bottom end. On this are wrapped two layers of glass cloth and fiber mat (each layer consists of two sheets of fiber mats placed alternately between three of glass cloth). Each layer is bound in place by an open-wound helix of glass tape; the whole assembly is butt-wrapped with glass tape held in place by four metal clips.

In operation, the glass-wrapped filters are hooked up in multiple-unit banks. Each bank can be taken off stream individually for blow-back to remove accumulated catalyst filter cake. During the blow-back operation, the glass tape permits a slight movement of the wrapping layers, thereby facilitates the removal of fine catalyst dust from the flexible porous filter.

Pressure drop across the filter varies with surface area, gas volume, thickness of catalyst cake and blow-back frequency, says Riley, but is generally between 2-3 psi. Maximum operating temperature of the fiber-glass units is 450-500 C, but it's estimated that similar units wound with refractory cloth and mat (e.g., Refrasil) could withstand temperatures to 1000 C.

**Anhydride Condensers:** The second operation to come in for special treatment at Orgreave was product condensation and recovery. One method of recovering the product involves the use of large metal or wooden chambers ("barns" or "hay boxes") in which the product gas velocity is reduced sufficiently to permit cooling and crystallization of phthalic anhydride. But for large-scale production, the simplicity of such a system is outweighed by inherent disadvantages:

Manual removal of the product from barns requires the use of fully protective clothing; finely divided phthalic anhydride dust causes serious pollution problems; corrosiveness of the cooled gas stream (resulting from formation of free maleic and phthalic



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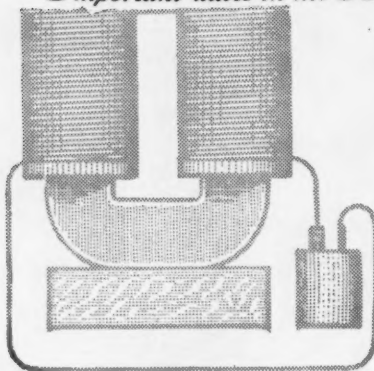
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## PRODUCTION

acids as the temperature falls below the dew point of moisture in the gas) necessitates the use of stainless steel or wooden construction. Too, the size of the chambers required to handle large volumes of product introduces the added hazard of working with dangerously large quantities of organic material in each collection unit.

The original design of United Coke's phthalic plant called for two large tubular condensers (instead of barns) connected in parallel and operating alternately—one condensing while the collected product was melted out of the other. When the plant started up, this arrangement proved to be inefficient, highly critical to operate.

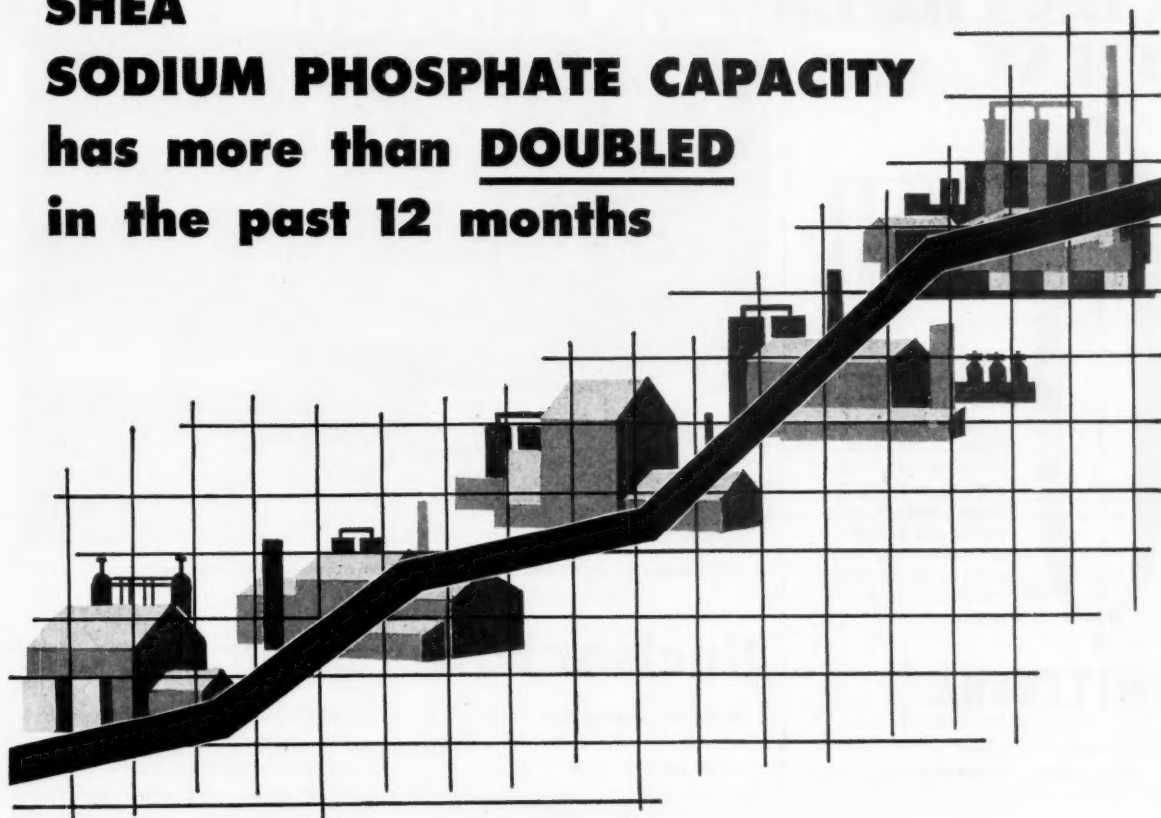
United Coke had the choice of going back to barns or developing more efficacious condensing equipment. It elected to try the latter course, set three goals for a workable system:

- Simple maintenance—units must permit ready access for correction of operational troubles, such as corrosion, leaks, stoppages, dirty heat exchange surfaces.
- Safety—system must be intrinsically safe, free from explosion hazards.
- Economy—heat exchangers similar to those employed in air conditioning were chosen for their efficiency, low cost.

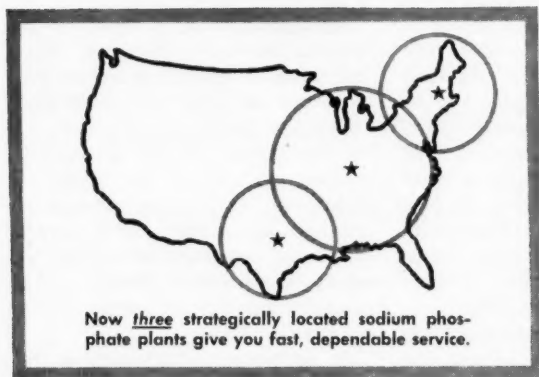
The company experimented with multiple-bank arrangements of spiral-finned tubes, finally evolved a design that combined a high capacity for solids with low pressure drop. Eight of these units were installed in a parallel arrangement to provide maximum flexibility in the condensing-melting cycle. Combined capacity of the units is sufficient to allow one at a time to be taken off stream for maintenance without interrupting the operation. The parallel connection also provides a self-regulating distribution of product-laden gas since back-pressure buildup automatically diverts the bulk of the gas from those units in which there is an appreciable accumulation of phthalic anhydride.

Both the catalyst and the product recovery schemes have been in use for several months. And though throughput of the plant has now been substantially increased, Riley cautions that final judgment on the new features must be postponed until the plant has been operated for a much longer period.

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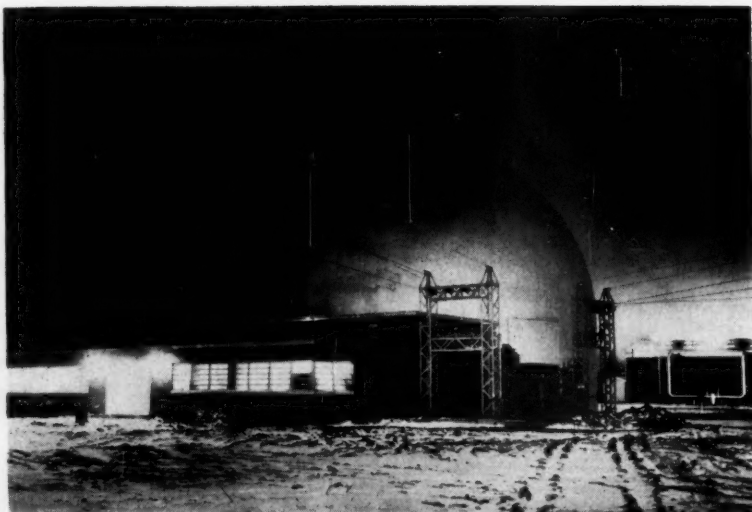
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## PRODUCTION



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## Nuclear Power Switch Is On

With the startup last week of Argonne National Laboratory's Experimental Boiling Water Reactor, AEC harvested the first fruit of its carefully cultivated nuclear power reactor program. Though the EBWR is the first to be completed under the program, it's only the beginning of a large crop of nuclear power reactors scheduled to go critical during 1957. A second—the Army Package Power Reactor—is now being readied for operation at Fort Belvoir, Va., will go critical in the near future.

**Direct Boiling:** Of the five basic types of reactors being studied under AEC's reactor development program, the EBWR is the third (others are the pressurized water and fast-breeder reactors) originated at ANL. Its purpose is to demonstrate the practicality of producing power from steam generated by direct boiling of water within the reactor vessel itself.

ANL engineers studied the boiling-water principle in a series of tests (the Borax reactor experiments) at the AEC National Reactor Testing Station in Idaho, proved that a boiling-water system is self-regulating and inherently safe. Even the violent destruction of the first water boiler (Borax-I was deliberately destroyed in a transient nuclear reaction) proved that extraordinary measures were required to produce a damaging reaction. Subsequent tests at higher pressures (in

Borax-II) and in conjunction with a turbine-generator (in Borax-III) provided the design data for the EBWR.

In operation, the plant generates steam by the heat (20,000 kw.) of fissioning, slightly enriched (1.44% U-235) uranium fuel, feeds it at 600 psig. to a 5,000-kw. turbine-generator. Spent steam is condensed and returned to the reactor pressure vessel. Circulation of cooling water through the core is by natural convection.

**Simplifies Control:** A big advantage of the boiling-water system is its direct connection of reactor and turbine that eliminates the need for costly heat exchangers. All equipment is designed for continuous remote control, is equipped to prevent the escape of radioactive water or contaminated material. To further guard against radioactive contamination of the atmosphere, the power plant is sealed in an airtight steel shell when the reactor is operating.

In addition to demonstrating the efficiency of a boiling-water reactor for power generation, the EBWR will also be used to test such operating techniques as forced circulation to achieve higher power outputs. And equipment for handling heavy water is already installed for future test operations that will provide design data for larger power reactors, some of which may burn normal uranium.

**Power Package:** Small enough to

# Goodrich-Gulf Chemicals, Inc.

Ameripol  
Code

## REMARKS

## APPLICATIONS

### HOT POLYMERS

- 1000 • General purpose hot rubber adaptable to most black products or products where color is unimportant.
- 1001 • More resistant to staining and discoloring than 1002.
- 1002 • Higher tensile and lower modulus in cured compounds than 1000 or 1001. Tends to slower curing, thus some adjustment might be necessary.
- 1006 • Improved non-discoloring and non-staining polymer.
- 1007 • A glue-acid coagulated staining polymer with relatively low water absorption, low ash, and improved electrical properties.
- 1009 • Non-staining cross-linked polymer. Use of small quantities with other type polymers effectively reduces shrinkage and die-swell in calender and extrusion operations.

### COLD NON-OIL POLYMERS

- 1500 • General purpose cold rubber where color and staining is unimportant.
- 1501 • Same as 1500 except slightly staining stabilizer which permits use in some darker colored products.
- 1502 • Relatively non-discoloring and non-staining cold rubber.

### COLD OIL-EXTENDED POLYMERS

- 1703 • General purpose relatively non-discoloring, non-staining polymer containing 25 parts oil. Presence of naphthenic oil may affect stain characteristics.
- 1705 • General purpose polymer containing 25 parts aromatic oil for use where staining, discoloring is unimportant.
- 1707 • Similar to 1703 but for 37.5 parts naphthenic oil, and emulsified with rosin soap rather than mixed soaps.
- 1708 • Relatively non-discoloring, non-staining polymer containing 37.5 parts naphthenic oil. Glue acid coagulation provides lower water absorption and improved electrical properties.
- 1710 • Similar to 1705 except for 37.5 parts of an aromatic oil.
- 1712 • General purpose oil extended for use where color is unimportant. 37.5 parts high aromatic oil.

- Tires, molded and extruded mechanical goods, and many general purpose applications.
- Tires, molded and extruded mechanical goods, shoe soles and heels.
- Tires, molded and extruded mechanical goods.
- Light colored and white products such as white side-wall tires, shoe soles, floor tile, toys, etc.
- Wire and cable insulation, electrical matting, gaskets, hard rubber products, etc.
- Wherever control of shrinkage is important—footwear, wire and cable insulation, calendered sheet goods, camelback, soles and heels.

- Tires, camelback, molded and extruded mechanical goods.
- Tires, molded mechanical goods.
- Light colored and white products such as white sidewall tires, white and light colored mechanical goods, floor tile, hospital sheeting, toys, shoe soles and heels.

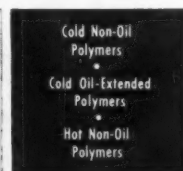
- Light colored and white products—tires, mechanical goods, floor tile, hospital sheeting, toys, shoe soles and heels.
- Tires, camelback, molded and extruded mechanical goods.
- Tires, camelback, shoe soles and heels, molded and extruded mechanical goods.
- Wire and cable insulation, athletic goods, coated fabrics, molded and extruded mechanical goods.
- Tires, camelback, molded and extruded goods.
- Tires, camelback, molded and extruded mechanical goods, wire and cable insulation.

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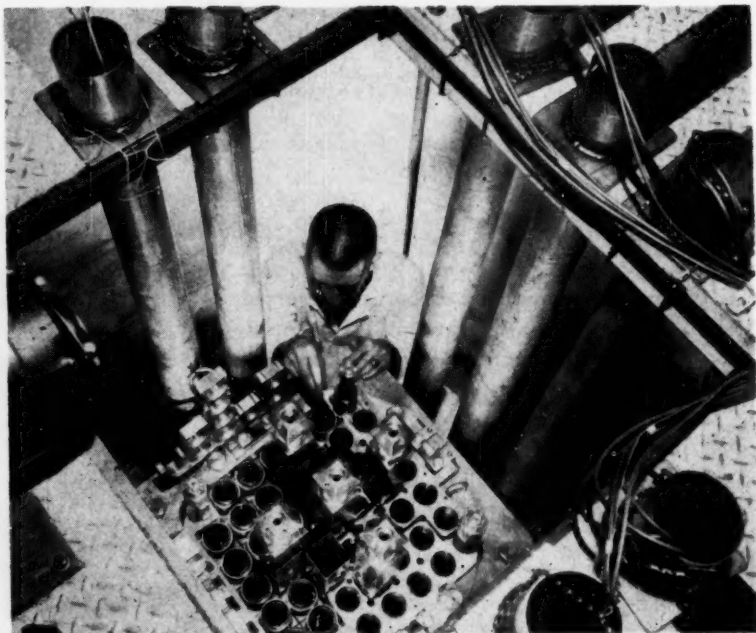
fit on a tennis court, the Fort Belvoir APPR was designed by Alco Products to meet heat and power requirements of military services in remote areas. The compact, 14-ton reactor is of the pressurized-water type.

The APPR will be fueled with a highly enriched  $UO_2$  dispersion, will

develop 10,000 kw. of heat, 2,000 kw. of electrical power. Unlike the EBWR, the package power plant employs a heat exchanger to extract heat from primary cooling water at 450 F, 1,200 psi. and generate steam at 407 F, 200 psi. to drive a turbine generator.

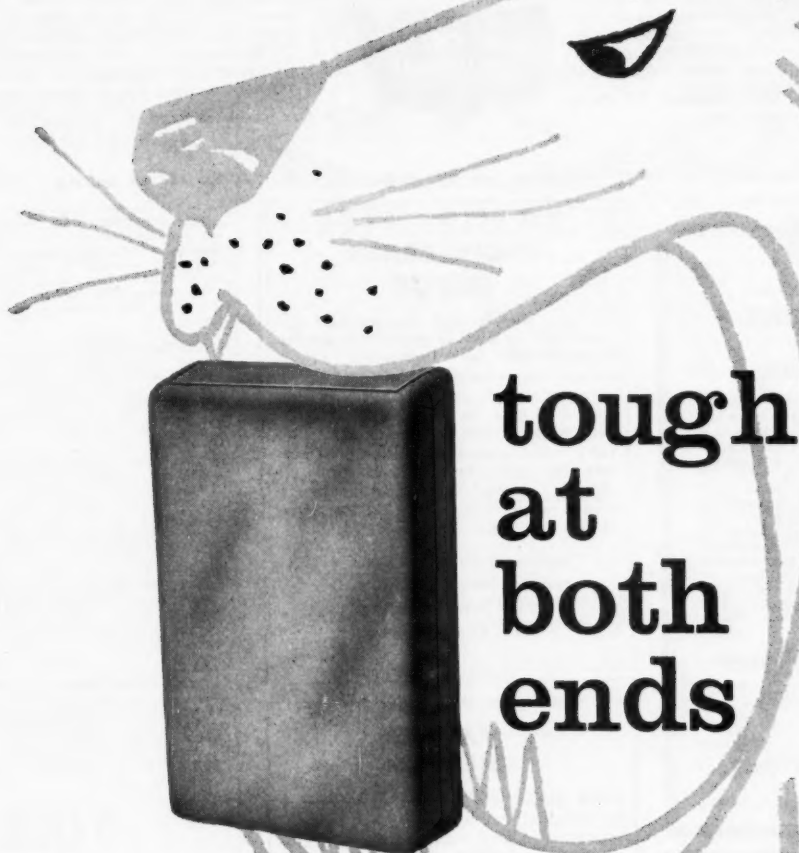


APPR'S REACTOR (on crane) is compact, designed for transportability.



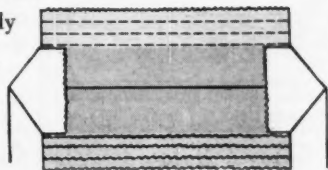
CORE CONTROLS within the dome are readied for 'critical' startup.

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## Positions Wanted

**(Female) Executive Assistant. Secretary, B.S.** Chemistry, aptitude for figures, experienced editing, technical reports, high caliber, excellent references, responsible, desires non-routine position. New York Metropolitan area. PW-3716, Chemical Week.

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<b>Detroit 26</b>	856 Penobscot Bldg., Woodward 2-1798
<b>London</b>	H. Lagler, McGraw-Hill House, 95 Farrington St., E.C. 4, England
<b>Los Angeles 17</b>	Peter Carberry, 1125 West Sixth St., Madison 6-9351
<b>New York 36</b>	Knox Armstrong, P. F. McPherson, Charles F. Onasch, L. Charles Todaro, 330 West 42 St. Longacre 4-3000
<b>Philadelphia 3</b>	William B. Hannum, Jr. Architects Bldg., 17th & Sansom Sta., Rittenhouse 6-0670
<b>Pittsburgh 22</b>	919 Oliver Bldg. Atlantic 1-4707
<b>San Francisco 4</b>	William C. Woolston, 68 Post St., Douglas 2-4600
<b>St. Louis 8</b>	3615 Olive St. Continental Bldg., Jefferson 5-4867

Another client benefits from a Badger "Precious Plus"

An Achievement of  
Creative Engineering:

## STYRENE FROM GASOLINE!

Sketch shows Cosden Petroleum's new ultra-fractionation and styrene manufacturing plant as it will appear when completed in early 1957. The four columns — each almost 200 feet high — will be among the tallest ever erected!

### The plant that "couldn't be built" now under construction

At Cosden's Big Spring, Texas, refinery, Badger is erecting the first plant ever designed for the recovery of ethyl benzene by distillation. The process *first* became commercially practical when Badger Engineers developed Ultra-fractionation.

Now, instead of marketing catalytic reformer effluents as mixed solvents, this new distillation process will make it possible for the client to produce a pure product with a far higher profit margin.

This achievement in *Creative Engineering\**, like all intangibles, can never be shown on the blueprints. Yet it is the "Precious Plus" in Badger's performance that is making Cosden's plant possible!

Other leading companies, too, find Badger's *plus* in performance of precious advantage — whether their need is design, engineering or construction. How else explain the unusual growth Badger is enjoying?

+ You need new "yardsticks" to measure the plus performance of Badger. For the abilities of this dynamic organization go far beyond what can be shown on blueprints—and it's such intangibles that add up to better processes and plants, faster and at lower cost.

\*Creative engineering . . . whether your process problem is common or complex, Badger engineers solve it with fresh thinking that frequently produces new efficiencies, unexpected savings.

Broad experience . . . Badger Engineers are more than competent—most staff members are recognized authorities in their fields.

Key Man operation . . . the Badger man who submits your proposal is *always* a principal—always the Key Man responsible for the execution of your job. Clients say, "This is the Badger difference that makes the difference."



## BADGER MANUFACTURING COMPANY

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